

The Iron Age

A Review of the Hardware, Iron and Metal Trades.

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Dubois & Francois' System of Driving
Headings in Flery Mines.

One of the greatest problems to be solved by the mining engineer is that of rendering work in fiery mines less dangerous without so materially adding to the cost of working as to preclude financial success. Efforts to trace the causes of explosions in coal mines—

shifts, thus making an advance of 5.7 feet per shift.

These figures show that the work by the Dubois-Francois system is slow, but, on the other hand, it is perfectly safe so far as explosion is concerned. It is claimed besides that it is cheaper than other methods, and it has the decided advantage over methods of wedging hitherto suggested in that the apparatus for drilling the holes and driving in

the failure of the company of which Grant was a partner it was operated by Connell, Tarr & Co., who likewise failed. The immediate neighborhood of this ruin abounds in iron ore of good quality, easy of access, and with limestone and coal limitless in quantity. It may seem strange to people of this day that the coal, abundant as it is, was not used at all, but that the immediate vicinity was stripped of its wood, the bulk of

over a crossing on the Lebanon Valley branch of their road, west of Palmyra.

British Foreign Trade.

An important discussion took place at the autumnal meeting of the Associated Chambers of Commerce of the United Kingdom, which has just been held at Sheffield, upon

they might have and disseminate accurate information upon the subject. A short time ago, as a preface to this discussion, he had distributed among the Chambers of Commerce a treatise, giving in great detail the exports and imports in this country and elsewhere. Now, he only proposed to give these facts broadly without going into detail. From the year when the statistical abstract was first published (1840) until 1872, British

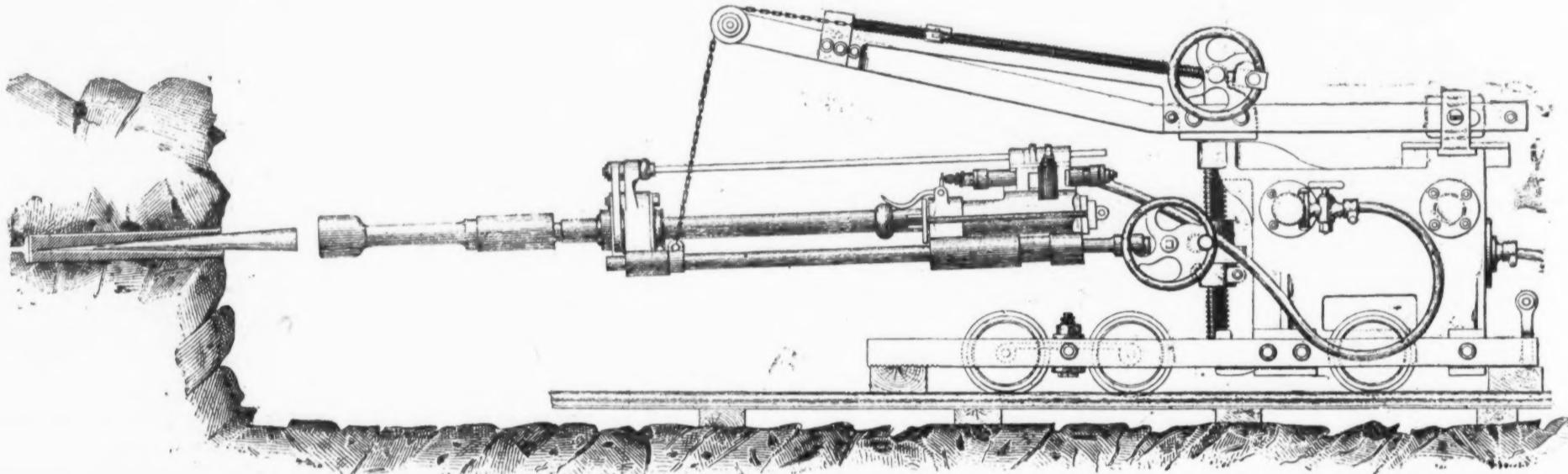


Fig. 1.—THE DUBOIS & FRANCOIS DRILL AND WEDGE HAMMER.

for example, the recent brilliant researches of Galloway on coal-dust explosions—have gone far to explain much that once seemed profoundly mysterious. A clear insight into all conditions must of course be the basis of preventive measures, which have hitherto been chiefly ample ventilation, the exclusive use of safety lamps and the enforcement of a strict police code for the examination of the mine and the exclusion of anything which might endanger its safety. One of the main causes of explosion has always been the necessity, in many cases, of driving the main headings for opening out the veins of coal for working by blasting. It is to the avoidance of this danger that the well-known Belgian engineers, Messrs. Dubois & Francois, of Seraing, inventors of the rock drill bearing their name, have devoted their energies.

The accompanying illustrations, Fig. 1 shows the apparatus used. It consists of a compressed air drill mounted on a carriage standing on the mine track. As the cut shows, the drill of large dimensions is attached to a vertical rod, permitting a lateral motion, while a crane is used to maintain it in the inclined position chosen for the special case. This disposition makes it possible to drill a hole in any given direction and at any height. The location of the first hole, drilled in the ordinary manner, is such that the least resistance is offered to the removal of the greatest body of rock. When its depth is sufficient the drill rod is taken out and a mass of iron weighing from 60 to 80 pounds is attached to the piston rod in the same manner as the drill. A wedge and corresponding split bearing surfaces are inserted into the hole, and the drill worked as a hammer. The location of the holes and their effect must necessarily depend upon the nature of the ground, the question being whether the heading is run through rock or along the strike of a vein, and the dip of the latter (Figs. 3 and 4) show examples of the location and the succession of the holes. A series of work was done in the mines of the Marihaye Company with a drill the piston of which was almost half a foot in diameter, while the striking weight was 300 pounds and the working pressure 3 atmospheres. The total weight of the carriage was 4000 pounds, which is accounted for by the size of the reservoir (shown in Fig. 1) for the compressed air. This reservoir serves to regulate the pressure of the compressed air and acts as counterweight to the drill. The rock displaced is removed while the machine is at work. The first experiment was made in a heading on a one-foot vein with hard siliceous country rock. A hole 1.5 feet deep was drilled in 15 minutes (including removal of drill); the wedging required 10 minutes, or 25 minutes in all, to displace rock equivalent to a blast from a 1.5 foot hole. A heading 6.3 x 4.9 feet from the "Dure" vein to the Delyée vein was driven through country rock a distance of 59 feet in 82 eight-hour working shifts with two workmen per shift; another heading on the Many pit, running through 70 feet of schist and 50 feet of sandstone, was finished in 280 shifts, the rate of advance being 0.6 feet per shift in schist and 0.5 feet in sandstone. In the Seraing Pit a heading 277 feet long was completed in 405 shifts of 8 hours by two workmen. As an example of work on the strike of the vein, 289 feet were excavated in the "Grande-Veine" in the Flémalle in 62

the wedge is in one machine. Its value seems to be chiefly for driving headings on the strike of the narrower coal beds, while at the same time it offers to engineers a welcome means of safe advance through hard rock in extreme cases. Naturally the application of the simple principle first applied by Messrs. Dubois and Francois is not limited to their rock-drilling alone, but may be readily made use of by any percussion drill.

which was first charred for use in the furnace. The lining of the furnace presents the most perplexing difficulties to the experienced ironworker of to-day; before fire-brick was manufactured that people had a kind of stone which seems to have increased in durability and hardness as the heat was intense. The interior is so well preserved that nothing but the removal of support will cause it to fall, being strongest and most im-

portant. The decline of the foreign trade of Great Britain. The topic was introduced by a resolution from the Sheffield Chamber of Commerce, "that in the opinion of the association it was desirable that a Royal Commission or a select committee should be appointed for the purpose of making an inquiry into the present condition of British foreign trade; and that such commission or committee should investigate the causes of the

trade progressed with great rapidity. There were comparatively few fluctuations. During that period there were wars and rumors of war, revolutions and famines, and all those untoward events which during any long period of time must occur; but, notwithstanding that, British trade increased most prosperously. But since 1872, exactly the opposite state of things had prevailed. Since that year a very great decline had taken place. Their exports, which in 1872 amounted to £256,000,000, had in 1877 sunk to £198,000,000. And for the first seven months of the present year, ending with July, there was still a decrease of £1,760,000. While this immense diminution had been taking place, a diminution which if continued would inflict great misery upon nearly all the manufacturing towns of England, their imports had been increasing.

A paper had been published only a few weeks ago by her Majesty's Commissioners of Customs which threw some light upon the question. According to that paper manufactured articles were imported into England in 1873 to the value of £35,000,000, and in 1877 to £46,000,000, so that while their own sales had been so rapidly diminishing, purchases of manufactured articles had been quite as rapidly increasing. That was not all. Turning from the statistics of their own foreign commerce to those of foreign nations, they found a very forcible illustration, at least an explanation as to where some of their trade had gone. Only a fortnight ago the statistics of the exports of the United States for the fiscal year ending June 30, 1878, were published. The increase in exports from the United States during the last year had been \$91,000,000, and in the year preceding \$64,000,000, so that in two years the exports from the United States of domestic produce had increased to \$155,000,000. He went on to say that there was scarcely a manufacturing country in the world that had not either been maintaining its position during the last few years, or had been rapidly increasing its exports, while their own exports had rapidly fallen off. He also reviewed at some length, and with considerable severity, some of the tables of statistics which had been going the rounds giving too favorable a view of their traffic. It had been worse than they represented. He himself knew the facts. He did not want this Royal Commission for his enlightenment, but that the real facts might go out with an authoritative endorsement which would compel attention and action. Very naturally this motion thus presented drew forth considerable opposition, in which conflicting views of free trade and tariffs were mixed up. The effort was also made to show that hard times were with them they were no worse than in other countries. The resolution finally prevailed, though by a small majority. It is hardly likely that any Royal Commission will come of it, but a good deal of respectable, not to say authoritative, testimony as to the condition of British trade has already been the result.

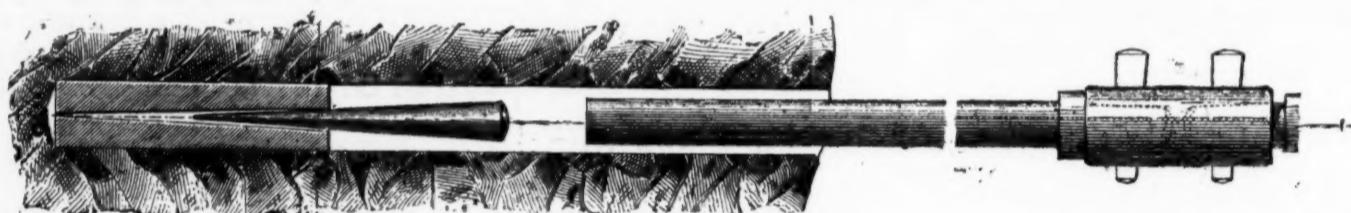


Fig. 2.—HAMMER AND WEDGE.

With so simple a means at their disposal we would consider the firing of a single shot in a fiery mine a criminal act of recklessness, even though the rate of advance be slow when compared to the results achieved by modern methods of mining. The wedging down of coal by machinery is not a novel proposition, but none hitherto attempted is so simple and so generally applicable.

previous to action of pick where fire-brick would have been weakest. Will not some of the scientists of Butler show us the quarry? * * * Much of the metal there reduced was molded on the ground into skillets, kettles, grates, &c., which found a market at the furnace, the purchasers being from the sparsely settled region for 25 miles in all directions. We have been told that many of the kettles, pots, &c., manufactured here

decline of British exports." The member from Sheffield, Mr. Brittan, who introduced the motion, said he thought he must assume that all members of the association were impressed with the necessity that the mercantile community should be very well informed as to the condition of our trade. It was desirable that all dangers by which they were menaced should be clearly foreseen, and measures taken to avert them; but while all

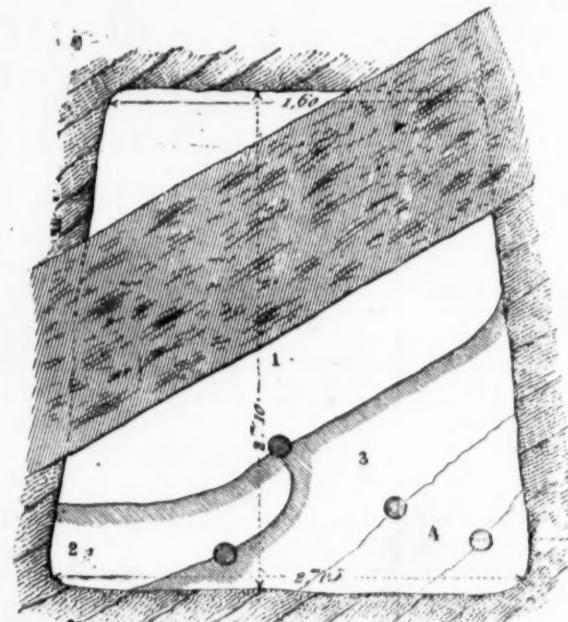


Fig. 3.—SECTION OF HEADING ON VEIN.

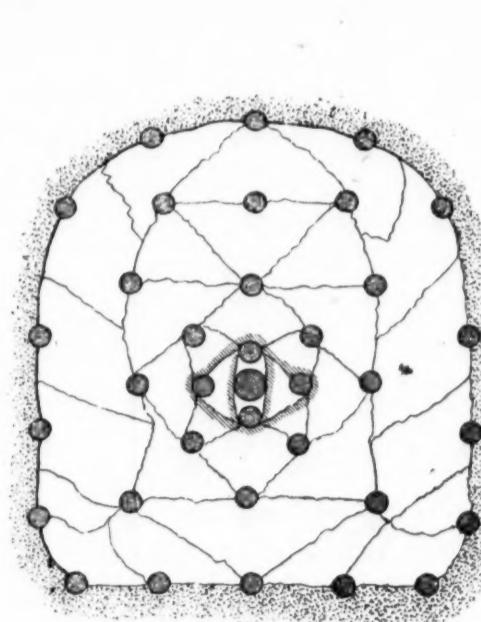


Fig. 4.—SECTION OF HEADING IN ROCK.

Hancock Iron Works.—The New Cumberland (W. Va.) *Independent* says: In Butler District, on King's Creek, about one-half mile below the old Mahan mill, stands a circular ruin whose history is suggestive not only of the march of time, but also the improvement in reducing iron ore and the subsequent processes by which it is rendered useful. This furnace was built during the last century by a man named Grant. After

are yet preserved in those houses where the occupation has been continuous, and that the metal is of superior character. The residue of the metal, crude and manufactured, was transported over the hills to Wellsburg, the home and place of business of John Connell and Peter Tarr, owners of the manufac-

ture. On this question, he doubted not there would be some difference of opinion as to the means which should be taken for protection. Before he asked for the votes of the association, it would be necessary for him to give some justification of the motion. The Sheffield Chamber of Commerce thought that one of the means by which great good might be accomplished would be the appointment of a committee or commission in order that

the threatened war between the Argentine Republic and Chili has not yet broken out, but a peaceful solution of the difficulty seems improbable. It is expected that Peru and Bolivia may take a part in the contest should war be declared, the former on the side of Chili.

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SEE PAGE 9.

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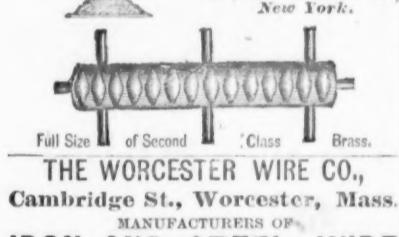
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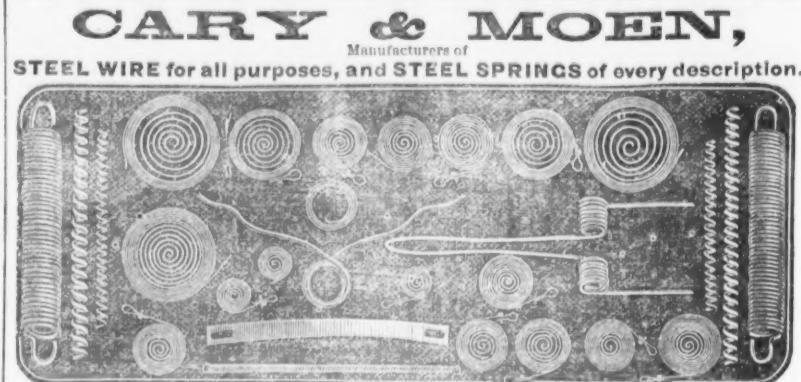
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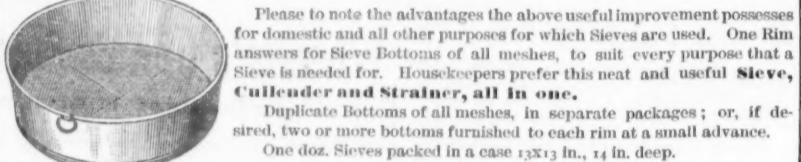
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We have received another batch of reports from the State Department, from which we extract such portions as will be likely to interest our readers.

Mr. Catlin, United States Commercial Agent at La Rochelle, France, reports, under date of August 13th, that at a convention held on the 4th, under the auspices of the Agricultural Commission of the Arrondissement of La Rochelle, the president of that body urgently appealed to his hearers to substitute, as far as possible, agricultural machines and implements for hand labor. Monsieur E. Bonscasse, president of the Agricultural Society of La Rochelle, (and principal of a school of farming near this city) at the same meeting still more urgently pointed out to the farmers the necessity of replacing the worn-out methods of their ancestors by modern agricultural improvements. "In view of the above facts," the consul says, "it is probable that a great impetus will be given to the demand in this district for agricultural machinery—indeed, an increased demand is already reported by the two houses concerned in the sale of such wares in this city, and I hasten to acquaint the department with the fact in order that our American manufacturers may have an early opportunity to compete, and derive any possible benefits resulting therefrom."

Mr. Cooper, Consul at Glasgow, reports that the rate of wages now paid is about 7 per cent. higher than it was five years ago (except that of miners, which has declined 100 per cent.), but it is now declining, and if the present stagnation in trade continues will soon fall even below former rates. There is yet no corresponding decline in the cost of living, which to the lower classes is about the same as in the States. Meats and fruits are quite beyond the reach of those classes, being far dearer than they are in America. Vegetables of all kinds are also 100 per cent. dearer. Rent, clothing, bread and sugar, tea and coffee cost about the same in Glasgow as in New York. Whiskey, which is considered a positive necessity by the great mass of laborers here, costs about 300 per cent. more than it does in America, and with beer, which is comparatively cheap, and as unwholesome as cheap, absorbs the larger portion of the laborer's earnings. There are eleven banks of issue in Scotland, with their branches, each working under its own special charter. The circulation of each bank is unrestricted. It is only required to redeem its issue in coin, and to hold an amount of coin equivalent to the excess of actual circulation over the authorized circulation. Only about 5 per cent. of the circulation is coin, four-fifths of which is silver. Paper is universally preferred, and gold coin never called for or desired except for special purposes. Laborers of all classes are paid off in silver, which is in constant demand for change and sometimes commands a small premium over gold or paper, owing to the fact that the paper is the smallest denomination issued.

Mr. Richmond, United States Consul at Cork, Ireland, gives the following as the ordinary wages paid to laboring and mechanic classes of Cork and vicinity: Agricultural laborers, 6c.; coal heavers, 7c.; masons, 8c.; painters, 9c.; and bakers, \$1.00; masons, shoemakers, painters, and joiners, \$1.21; engineers in tug boats, per week, \$12.16; firemen, \$6.65; sailors, \$6.07. Laborers on public works, per day, 48c. to 6c.; boys, 24c. to 40c.; excavators, quarrymen, 73c. Guards on railways, per week, \$4.38 to \$7.29; head porters, \$4. 3 to \$4.86; porters, \$3.40 to \$3.59; engineers, per day, \$1.21 to \$1.70; firemen, 60c. to 85c.; cleaners and steam raisers, per week, \$2.92 to \$4.35; gaugers, \$4.13; milesmen, \$3.40. The gaugers and milesmen also receive a gratuity of \$4.86 at Christmas. These men have the charge of the repair of the permanent way, and in the summer of 1877 struck for a slight advance on the above pay, but after holding out for some two months were obliged to come back at the old rates.

The food of the above classes, with the exception of engineers and guards, is made up of a selection from tea, milk, bread, oatmeal, potatoes, dried fish and, among the poorer people, a coarse Indian meal, which is used instead of oatmeal. The cost of this subsistence varies slightly in different localities, the highest, 1c. per day, being about the expense in Cork, Queenstown and their neighborhood. Rent and clothing cost about \$35 a year, making a total of about \$85. The mechanic pays something more for a better lodging, but in other respects his living is the same as the laborer. The cost of living is believed to have increased about one-sixth in the last five years, and wages have advanced in about the same proportion.

Trade in this district is much depressed, as it has been for some years past, and many failures have taken place among the grain and dry goods merchants. Cork is the principal port in the south of Ireland for the importation of wheat and Indian corn for distribution throughout the district for distilling, feeding and milling purposes. Transactions in these grains are nominally conducted for cash, but in reality short notes are usually received for the cargoes. The distilling of whiskey is a large business, the last accessible report showing an export for the year of 3516 puncheons and 6031 hds.; this is also sold on short time. The district is, however, essentially an agricultural and stock-raising one, and large quantities of pigs, sheep, cows and calves are bought of the farmers for cash and sent over to the English markets. Butter to the amount of nearly 500,000 firkins passes annually through the butter exchange of Cork and is sent to England and Scotland, the farmers usually selling their prospective crops for a cash sum in the beginning of the season, leaving a margin for the risk taken by the buyer, which has proved very profitable. All the branches of trade and industry in this district are seriously affected by the falling off of business with the United States.

Mr. Smith, Commercial Agent at Nottingham, England, says: There is great complaint here, as in all parts of England, of the very depressed state of trade. Manufacturers complain that their business is small and falling off, and there is a general cry of hard times. The employers of labor claim

that they are losing money or doing business

at so small a profit as to make it necessary to reduce the wages of laborers. The latter are not disposed to submit to reductions. The consequence is a great uncertainty as to the future. In this district there is much talk of the necessity of reducing wages, especially in the hosiery factories. The manufacturers complain that the competition is so sharp, especially from Germany, that a reduction of wages here is absolutely necessary. Of course the laborers resist. There has not yet been any decisive action on the part of the employees, but there is a very uneasy feeling on all sides. Shippers have been hoping for the revival of business with the United States, and they are still looking to that country for the beginning of better times. Up to this time there has been no increase of orders from our country, which is a liberal buyer in prosperous times.

The following shows the average wages of workers in the lace and hosiery trades, those being the principal industries here: Men (piece work) per week, 45/ to 77/; second class workmen 20 per cent. less. Young women 11 per week; girls (half-timers) 4/6; good fitters, 43/ to 49/. (The prices of provisions generally are about the same as those given in previous reports from other English districts.)

Mr. McMillan, Consul-General at Rome, gives the following information in relation to his district:

IRON.	IRON.	IRON.	IRON.	IRON.
NEW YORK.	NEW YORK.	NEW YORK.	PITTSBURGH.	PITTSBURGH.
OGDEN & WALLACE, Successors to GAM'L G. SMITH & CO., IRON & STEEL, 85, 87, 89 & 91 ELM ST., N. Y. COMMON AND REFINED BAR IRON. SHEET AND PLATE IRON, HOOP, BAND AND SCROLL IRON, Rod and Horse Shoe Iron, Angle and T Iron, Swedes and Norway Iron, Norway Nail Rods. Iron of all sizes and shapes made to order.	G. HUERSTEL, IRON and STEEL, Warehouse, 99 Market Slip, N. Y. Sole Agent for Sweet's Toe Calks, Constantly on hand, Refined and Common Iron, Horse Shoe Iron and Nails, Norway Iron, Cast, Spring, Toe Calk and Bessemer Steel Tire. Also SPRINGS, AXLES AND BOLTS. For Truck and Carriage Makers.	John W. Quincy, 98 William Street, New York. Anthracite & Charcoal Pig Irons, Wrought Scrap, Cut Nails, Copper, BLOCK TIN, LEAD, SPECTER, ANTIMONY, NICKEL, &c.	W. D. WOOD & CO.'S  PATENT Planished Sheet Iron. Patented March 14th, 1865; April 8th, 1873; Sept. 9th, 1873; Oct. 6th, 1874; Jan. 11, 1876. Guaranteed fully equal in all respects to the IMPORTED RUSSIA IRON, and at a much less price. FOR SALE, by all the principal METAL DEALERS In the Large cities throughout THE UNITED STATES. And at their Office, 111 Water Street, PITTSBURGH, PA.	A. G. HATRY, HATRY & FRIEND, Commission Merchants AND DEALERS IN Bar, Sheet, Tank, Boller, Angle, T, and Railroad Iron, Nails & Spikes, Steel & R. R. Supplies, WINDOW GLASS, GAS PIPE & BORAX. PITTSBURGH, PA.
PIERSON & CO., Established 1790, 24 & 26 Broadway, 77 & 79 New St. NEW YORK CITY,	A. B. Warner & Son, IRON MERCHANTS, 28 & 29 West and 52 Washington Sts. BOILER PLATE, Boiler Tubes, Angle, Tee & Girder Iron, Boller and Tank Rivets. Sole Agents for the celebrated "Eureka," Pennocks, "Wawasset," Lukens, Brands of Iron. Also all descriptions of Plate, Sheet, and Gasometer Iron. Special attention to Locomotive Iron. Fire Box Iron a specialty.	HARRISON & GILLOON IRON AND METAL DEALERS, 558, 560, 562 WATER ST., and 802, 804, 806 CHERRY ST., NEW YORK. have on hand, and offer for sale, the following: Scotch and American Pig Iron, Wrought, Cast and Machined, Bored Iron, Car-Wheels, Axles and Heavy Locomotive Iron, also Old Copper, Composition, Brass, Lead, Pewter, Zinc, &c.	BURDEN'S HORSE SHOES. "Burden Best" Iron Boiler Rivets.	JUNIATA  ROADSTER PATTERN. HORSE SHOES. Nails and Spikes, STEEL TOE CALKS. Horse Shoe Bar AND SHEET IRON. SHOENBERGER & CO. Pittsburgh, PA.
All Sizes and Shapes kept in Stock. J. H. JACKSON & CO., 308 & 309 Franklin St., N. Y., Importers and Dealers in IRON and STEEL. Agents for JOHN A. GRISWOLD & CO'S Bessemer Steel. MACHINERY STEEL, Cast Steel and SPRING STEEL, ANGLE and T IRON. Special Irons for Bridge and Architectural Work.	POWERSVILLE ROLLING MILL. JOHN LEONARD, 450 & 451 West Street, NEW YORK. Manufacturer of Best Quality HORSE SHOE IRON, And HOOPS. Also Best Quality Cold Blast Charcoal Scrap Blooms, And Dealer in OLD IRON.	GEO. A. BOYNTON BROKER IN IRON 70 WALL ST., N.Y.	Burden Iron Works, H. Burden & Sons, Troy, N. Y. B. F. JUDSON, Importer of and Dealer in SCOTCH AND AMERICAN Pig Iron, Wrought & Cast Scrap Iron, OLD METALS. 457 & 459 Water St., 233 & 235 South St., NEW YORK.	C. KANE, Dealer in SCRAP IRON. CAR SPRINGS, CAR AXLES, CAR WHEELS, OLD RAILS, Also Bar Iron, Pig Iron and Blooms sold on commission. DUQUESNE WAY, near 6th St., PITTSBURGH, PA.
ABEEL BROTHERS, Established 1765 by ABEEL & BYVANCK, Iron Merchants, 190 South Street and 365 Water, N. Y. ULSTER IRON A full assortment of all sizes constantly on hand. Refined Iron, Horse-Shoe Iron, Common Iron. Band, Hoop and Scroll Iron. Sheet Iron. Norway Nail Rods. Norway Shares. Cast, Spring and Tire Steel, etc.	MARSHALL LEFFERTS, 90 Beekman St., New York City, MANUFACTURER AND DEALER. Galvanized Sheet Iron, 1st and 2d Qualities. Galvanized Wire, Telegraph and Fence; Galvanized Hoop and Band Iron, Galvanized Rod and Bar Iron, Galvanized Nails, Galvanized Chain, Galvanized Iron Pipe.	P. W. GALLAUDET, Banker and Note Broker, Nos. 3 and 5 Wall Street, NEW YORK.	Passaic Rolling Mill Co., PATERSON, N. J. Iron Bridge Builders And Manufacturers of Beams, Channels, Angles, TEES, Merchant Iron, &c., &c. New York Office, 138 Chambers Street. WATTS COOKE, President. W. O. FAYERWEATHER, Treasurer.	H. E. COLLINS & CO., BROKERS IN Manufactured IRON, NAILS AND STEEL, Pig Iron, Iron and Steel Rails, METALS, Railway Supplies, Old Rails and Railway Scrap, PITTSBURGH, PA.
A. R. Whitney, Manufacturer of and Dealer in IRON, 56, 58 & 60 Hudson, 48, 50 & 52 Thomas, & NEW YORK. 12, 14 & 16 Worth Sts., Our specialty in Manufacturing Iron Used in the Construction of Fire-Proof Buildings, Bridges, &c. Plans and estimates furnished, and contracts made for erecting Iron Structures of every description. Books containing cuts of all Iron made sent on application by mail. Sample pieces at office. Please address 58 Hudson Street.	BOILER IRON Stamped and Guaranteed. All descriptions of Iron Work Galvanized or Tinned to order. Price list and quotations sent upon application.	Dan'l W. Richards & Co., Importers of and Dealers in SCRAP IRON, Pig Iron, OLD METALS. 88 to 104 Mangin Street, Foot of Stanton St., E. R., NEW YORK.	Moseley Iron Bridge & Roof Co., CORRUGATED IRON Buildings, Roofs, Shutters, Doors, Iron Sashes, Skylights, &c. 5 Dey Street, New York.	BALDWIN LOCOMOTIVE WORKS, BURNHAM, PARRY, WILLIAMS & CO., Proprietors, Philadelphia, Pa., U. S. A., Manufacturers of LOCOMOTIVE ENGINES of every Description. Catalogues, photographs and estimates furnished upon application of customers. NOISELESS STEAM MOTORS, For city and suburban Railways. These machines are nearly noiseless in operation; show no smoke with the use of anthracite coal or coke as fuel, and show no steam whatever under ordinary conditions of service. They can be run at two or three times the speed of horse cars and draw additional cars. Circulars with full particulars supplied.
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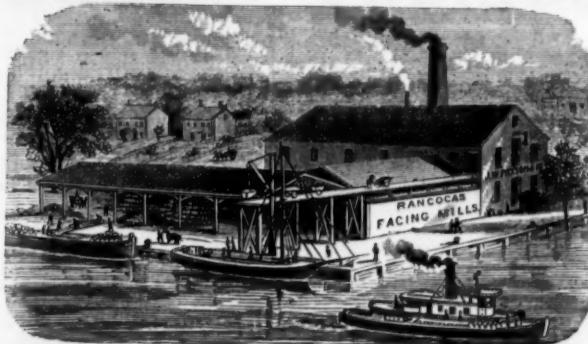
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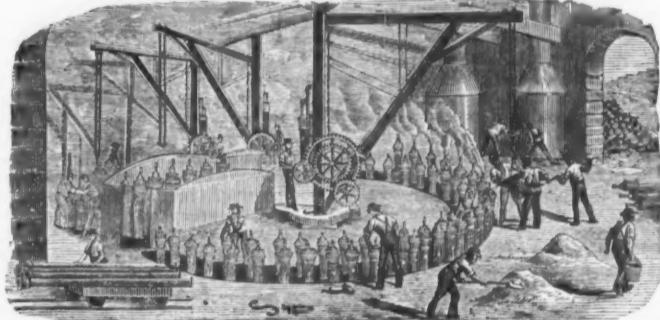
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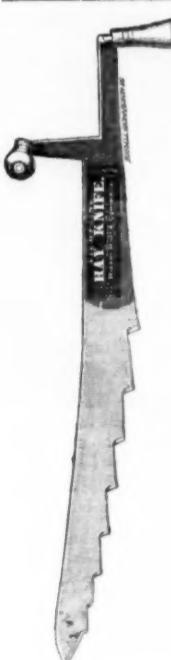
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The McKinney Mfg. Co., { Works, Allegheny City, Pa.
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Southern States Coal, Iron & Land Co.

LIMITED,

ENGINEERS, IRON FOUNDERS & BOILER MAKERS,

Coal Miners and Fire Brick Manufacturers.

The Only Makers in the Southern States of

WASHED FOUNDRY COKE,

Free from Slate and Sulphur.

Machine-Made Brick, Limestone, Lumber and Shingles.

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Apply to the HEAD OFFICE, South Pittsburg, Tennessee.

W. A. HOSKINS,
DEALER IN
MINERAL LANDS,
Chattanooga, Tenn.

Offers for sale, at very low figures, some of the most valuable Charcoal and Coke Properties within the district. Full particulars furnished on application.

Vulcan Iron & Nail Works,
Chattanooga, Tenn.

MANUFACTURERS OF

BAR IRON, NAILS, RAILROAD SPIKES, FISH BARS AND BOLTS BRIDGE
AND CAR BOLTS, AND FORGINGS GENERALLY.ROANE IRON COMPANY,
Manufacturers of and Dealers inPig and Railroad Iron.
CHATTANOOGA, - - - TENN.WASON CAR & FOUNDRY COMPANY,
Chattanooga, Tenn.,
Manufacturers of

RAILWAY FREIGHT CARS, Car Wheels and Castings.

TENN. COAL & RAILROAD COMPANY,
A. M. SHOOK, General Manager, - - - Tracy City, Tenn.

Proprietors of the Sevierville mines, capacity of 5,000 bushels of coal and coke per day. Several important institutions of learning, including the University of the South, also the celebrated Beersheba Springs, are located upon the line of this Railroad.

Being also the proprietors of several extensive tracts of very fine lands, offer special inducements to colonists. Communications addressed to the General Manager will receive prompt attention.

T. J. BROWN,
Rockwood, Tenn.
Miner and Contractor of
Fossiliferous Ores.

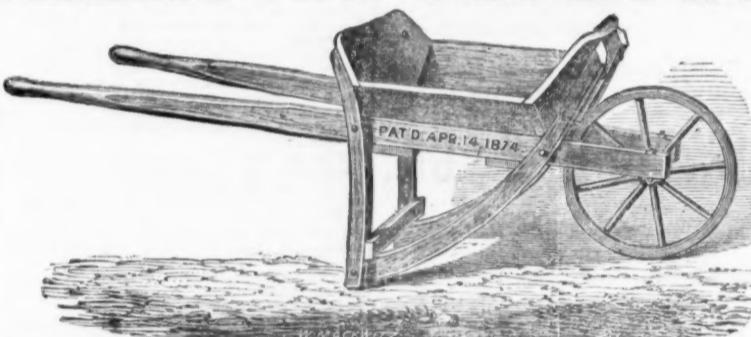
A superior article delivered at low figures at any furnace within the district or at any point on the Ohio River. Refer to Roane Iron Co., Chattanooga Iron Co., or S. B. Lowe, Chattanooga.

S. B. LOWE,
Pig Iron, Storage &
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Dealer in Charcoal and Coke Pig Iron for Foundry, Forge or Car Wheel purposes.

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CHAMPION BARROWS.



WITH WOOD OR IRON WHEELS.

A first-class article and a specialty, that will make a demand in any market and afford a good margin for dealers. We are prepared to furnish them in large quantities. Manufactured by

BRYAN MANUFACTURING CO., Bryan, O.

SAMPLE & BIRGE MFG. CO., Sole Western Agents, ST. LOUIS, MO.

For Sale by THE NEW YORK PLOW CO., General Eastern Agents, 55 Beckman St., New York.

STANDARD NUT CO.,

Pittsburgh, Pa.

MANUFACTURERS OF

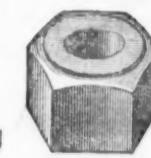
HOT PRESSED

Square & Hexagon Nuts,

R. R. FISH BARS,

BOLTS,

SPIKES,



RIVETS, &c.

IRON AND STEEL DROP FORGINGS

All shapes, small and large, including

Gun, Pistol, Wrench Bars, &c. Also, Die Sinking. Manufacturers also of
Bricklayers', Moulder's and Plasterers' Tools, Saddlers',
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MANUFACTURER OF

MALLEABLE AND GRAY IRON CASTINGS

For Car, Carriage and Tinsmiths' Hardware.

Corner Taylor and Buttonwood Streets, - - - WILMINGTON, DEL.

STANDARD
GIRARD WRENCH.
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TRADE

FOR

STRENGTH

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DURABILITY

IT HAS

NO SUPERIOR.

GUARANTEED

IN

EVERY RESPECT.

Wrought Bar, Head

and Screw.

Owing to the in-

creased demand

for these justly

Popular Wrenches,

we are now man-

ufacturing more than

any other establish-

ment in the world.

Our Wrench hav-
ing been imitated by
other manufac-
turers, we have adopt-
ed the above Trade
Mark, and will here-
after stamp all our
goods.

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TERMS AND PRICES.

GIRARD WRENCH MFG. CO., Girard, Pa.
PATENT CONVEX

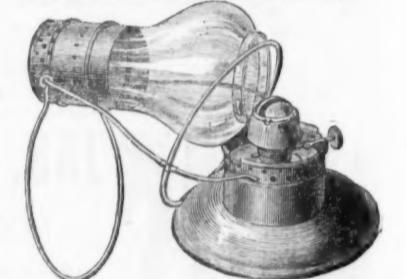
Fluting & Smoothing Iron.



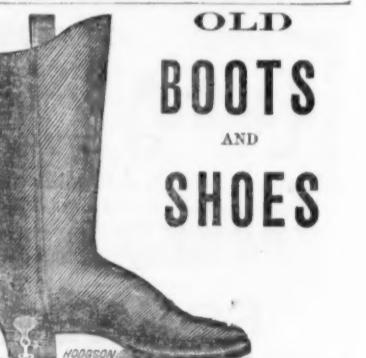
1st. It can be used as an ordinary Smoothing Iron.
2d. It is a Fluting Machine as well as a Smoothing Iron.
3d. The Fluting Attachment being made of brass, and convex in form, it has all the advantages of the crane machine.
4th. It combines the two articles in one, taking up the room of but one machine, and is always ready for use.

A. A. WEEKS, Manufacturer,
No. 82 John Street, New York.

Patent Lantern for Oil and Kerosene.



This Lantern is the most salable in the market; it burns Kerosene or Oil with superiority. The flame is regulated from the outside. The globe is removable. It is neat, Cheap, handy, compact and durable. It has more advantages than higher priced Lanterns. SEND FOR PRICE-LIST.

N. DUBRUL & CO.,
Manufacturers of Lanterns,
441 & 443 Plum St., Cincinnati, O.OLD
BOOTS
AND
SHOES

Can be Straightened
AND NEW ONES KEPT STRAIGHT
BY USING
LYON'S PATENT
Metallic
HEEL STIFFENER.

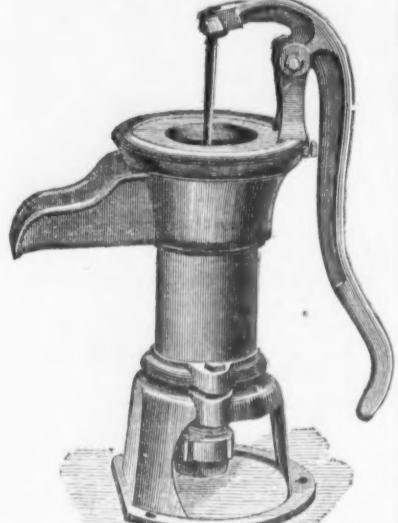
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N. LYON,
Sole Manufacturer,
ALBANY, N. Y.

Stove Repairs.

Repairs for Stoves made at Troy, Albany, Rochester
Cleveland, Buffalo, Boston, St. Louis, Quincy, Chicago
Milwaukee and elsewhere, at
W. G. METZNER,
127 W. Randolph St., Chicago, Ill.

The Largest Pump Works in the World.
Over 500 Different Styles.
PUMPS, STEAM PUMPS, ROTARY
PUMPS, CENTRIFUGAL PUMPS,
PISTON PUMPS,
Tanners, Paper Mills, Fire Purposes, suitable for all
situations imaginable.



Also, HAND FIRE ENGINES.
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The Oldest and Most Extensive Manufacturers of

PUMPS.

HYDRAULIC RAMS,
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Yard Hydrants, Street Washers.

AND OTHER

Hydraulic Machines

IN THE

WORLD.

Awarded the GRAND MEDAL of PROGRESS at WORLDS' EXPOSITION, VIENNA, 1873, being the highest awards on Pumps, &c., also, highest medal at PARIS in 1867, and Philadelphia, 1876, accompanied by Report of Judges.

Descriptive Catalogues and Price Lists sent when requested.

BRANCH WAREHOUSES,

85 & 87 John Street, N. Y.

AND

197 Lake St., CHICAGO, ILL.



AGATE
IRON-WARE

PATENTED
May 30th, 1876. Feb. 27th, 1877. July 3d, 1877.

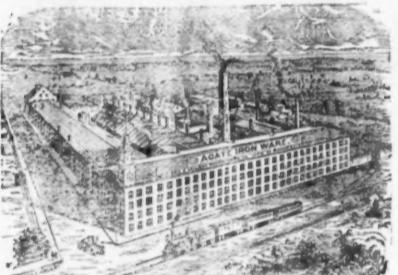
ABSOLUTE SAFETY
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GUARANTEED.

For Sale
EVERYWHERE.



The absolute Purity and Safety of
Agate-Iron-Ware is certified to by the
following eminent Chemists:

R. OGDEN, M. D., LL. D., of College of the City of N. Y.
R. H. MILLMAN, State Chemist, Yale College, New Haven, Conn.
HERBERT G. TORREY, U. S. Assayer, Office, 30 Wall St., N. Y.
S. C. EATON, M. D., Analytical Chemist at U. S. Assay Office.
S. D. COOPER, Chemist, New York.
HENRY MORTON, Prof. Stevens Ins. of Technology, Hoboken, N. J.
EDWD. S. WOOD, Prof. Chem., Harvard Med. Coll., Boston, Mass.
WM. RIPLEY NICHOLS, Professor Gen. Chemistry, Boston, Mass.
BOOTH & GARRETT, Practical & Analytical Chemists, Philadelphia.



Price Lists and Discounts will be sent only to the Trade, on application.

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HOWSONS'
OFFICES FOR PROCURING
UNITED STATES AND FOREIGN
PATENTS,

Forrest Buildings,
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German
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Attorneys,
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of Trade-Marks
BERLIN.

PATENTS.
THOMAS D. STETSON, 23 Murray St., N. Y.,
Patent Solicitor and Expert.

UNION MANUFACTURING COMPANY,

Manufacturers of all styles Plain and Ornamental Butts,

LOOSE PIN REVERSIBLE,

Cast Fast & Loose

Drilled and Wire Jointed.
Japanned, Figured Enamelled, Nickel Plated
and Real Bronze Butts. Also a full line of

IRON & BRASS PUMPS,

Cistern, Well, and Force Pumps, Yard, Drive
Well, Garden Engine and Steam Boiler Pumps,
Hydraulic Rams, etc., and all with the most modern
Improvements.

Centennial Spring Hinges.

This Hinge has two flat coil
springs, very powerful. It has a heavy
knuckle, giving much less friction
than a hollow pinto. It has
broad, solid bearings in the knuckle,
which do not wear down readily and
let the door sag. It is Fast Joint, therefore
can be used for either right or left hand. By actual test it has an
average of 50 per cent. more power
than other Spring Hinges in common
use of same size.

FINE CASTINGS a Specialty.

NEW BRITAIN, CONN.

Warehouses,

98 Chambers St., N. Y.
67 Kilby St., Boston, (Pumps.)

Henton & Denckin, 507 Com-
merce St., Phila. (Butts.)

Send for Illustrated Catalogue and
Price List.

**THE IMPROVED
HOWE SCALES**

In Competition with the World at Philadelphia, 1876.

TWO FIRST MEDALS, and TWO DIPLOMAS OF MERIT

The following are the points that the Judges officially announce as the basis of their award of the highest honors to the Howe Scales:

- 1st. For their Protected Bearings (the Howe is the only Scale with Protected Bearings), which makes
For their Strength.
- 2d. For their Simplicity.
- 3d. For their Economy in Construction.
- 4th. For their first-rate Material and Workmanship.
- 5th. For their various original Improvements and Adaptations (which being patented are exclusively possessed by the HOWE).

The Improved Howe Scales

MADE BY THE

HOWE SCALE COMPANY, of Rutland, Vt.

Are Guaranteed Superior to all others.

For Plans, Prices and other information, address,

A. M. GILBERT & CO., 95 to 101 Lake St., Chicago; 116 Main St., Cin-

cinnati; 157 Water St., Cleveland, O.; 612 N. Third St., St. Louis.

PRIEST, PACE & CO., 325 Broadway, New York.

" " " 213 Market St., Philadelphia.

" " " 145 Franklin St., Boston.

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M. C. HAWLEY & CO., 201 & 203 Market St., cor. Main, San Francisco, Cal.

" " " Sacramento, Cal.

FROTHINGHAM & WORKMAN. Portland, Oregon.

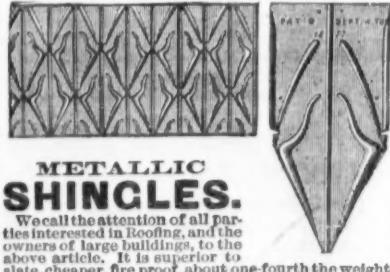
Montreal, Canada.

A. F. PIKE,
East Haverhill, New Hampshire,
Manufacturer and Wholesale Dealer in
Scythe, Axe, Knife and Hacker
STONES.

LETOILE,
UNION,
PREMIUM,
DIAMOND GRIT,
WHITE MOUNTAIN,
INDIAN POND (red ends).

stones gotten up or lathed in
any style desired. Price and
quality guaranteed.

Our Stones are of good
kg. and will not glaze.



METALLIC SHINGLES.

We call the attention of all
persons interested in Roofing, and
the owners of large buildings, to the
above article. It is made of
sheet copper, fire proof, about one-fourth the weight,
lays much closer, therefore is storm proof, cannot
crack, &c. Any carpenter can put them on. Send for
description and Price List to Iron Clad Manufac-
turing Co., 195 Greenwich Av., Brooklyn, L. B.
P. O. Box 2528, N. Y. City.

New Patents.

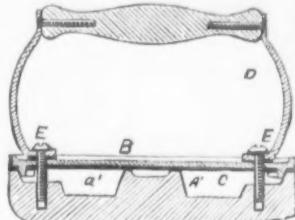
We take the following abstract of new
patents, recently issued, from the official
record:

MACHINE FOR FLANGING BOILER HEADS.

To L. Campbell and James F. Richards,
Pittsburgh, Pa.—June 25.—The heated plate
is secured in a revolving clamp, and its edge
is bent upward against a revolving resisting
roller by a vertically-moving revolving former.
The former and resisting roller are
peculiarly constructed, and each may be ad-
justed either vertically or horizontally, as
required. The mechanism for vertically
feeding the former is an improvement on
that described in Letters Patent No. 201,325,
issued to patentees March 19, 1878, and the
improvement consists in notching the loose
cam-collar and in pivoting to the side of the
arch-piece a catch bar, which normally
gravitates toward said collar and enters its
notch, holding the collar stationary, and
permitting the pawl on the fixed collar of the
feed screw to engage at certain intervals
with the notched head of said screw. The
upward movement of the former is con-
tinued until the catch bar is withdrawn
from the notch in the loose collar by a pawl
operated by a stud on the fixed collar of the
former shaft.

1. In a flanging machine, the combination,
with revoluble table P and a rest, v, for the
plate, of the vertical pressure roller c', having
positive independent motion, and a revol-
ving former, e, having positive independent
motion and capable of vertical feed.

A, having a dead-air space or chamber, a',
and a detachable metallic cap, B, a lining of
asbestos, C, forming a ceiling to said air
chamber and a non-conducting joint between
the body and cap.



2. The combination of iron A, having air
chamber a' and central post A', detachable
cap B, asbestos lining C, handle D, screws
E E and washer.

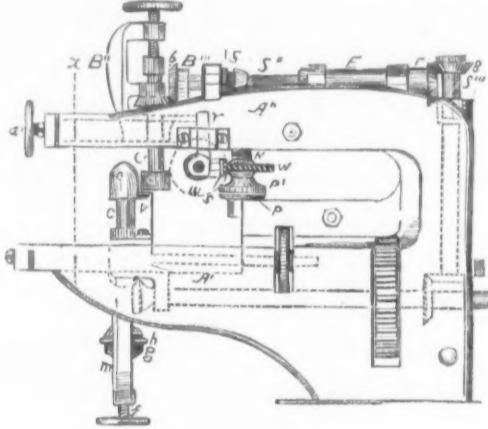
205,171. — **Pullock.** — Wilson Bohannan,
Brooklyn, N. Y.—June 25.

205,204. — **Reversible Latch.** — Milton C. Niles
and Sidney S. Niles, Oak Park, Ill.—
June 25.

By a screw in the face plate the talons are
thrown back to disengage them from the
knob-shank. They are then drawn forward
until the latch bolt projects enough to be
turned, so as to adapt it for a right or left
hand door.

205,275. — **Time Lock.** — Thos. F. Keating,
New York, N. Y.—June 25.

A disk similar to the combination lock
disk is rotated by the time mechanism. The



2. In a flanging machine, the combination,
with revolving table P and a rest, v, for the
plate, of the vertical pressure roller c', having
positive independent motion and capable
of lateral adjustment, and a revolving
former, e, having positive independent motion
and capable of both vertical and lateral
adjustment.

3. In combination, a revolving former, e,
and a vertical pressure roller, c', having its
periphery axially inclined, the pressure
roller c' being so inclined, substantially as
described, as to bear upon a plate only on
that side of its axis next to the former c.

4. The combination of presser foot P',
with its shaft S', collared and grooved as
shown, threaded sleeve k, shears A'', splined
gear 11, pinion 12, gear 14, spur 15 and
shaft S'.

5. The combination of sleeve k, shears A'',
worm-wheel W, worm shaft w, plate s,
sliding bearings r and brackets t.

6. The combination of notched loose collar
h, fixed collar g, with the described stud on
its upper surface, pivoted pawl n, having deten-
tive o, pivoted catch bar m, having notch
for the detent, with the shaft C, former e
and notched-headed feed screw f.

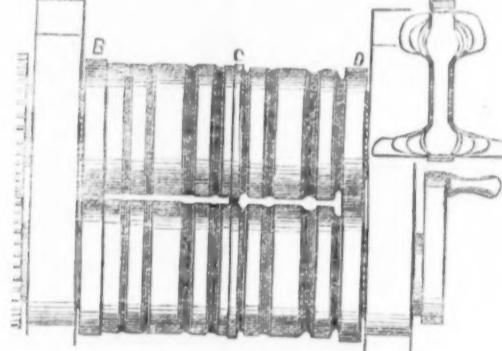
RE-ROLLING OLD RAILS.

To Thomas Glazé and William Westwater,
Pittsburgh, Pa.—June 18.—1. The herein-
described improvement in the art of reduc-

fence bar of the permutation lock projects
over the time disk, so that the lock cannot
be operated until the notch in the time disk
allows the fence bar to drop into the disks.

The following trade-mark was issued
June 18, in the United States Patent Office:
Axes.—Kloman, Park & Co., Pittsburgh,
Pa. The arbitrarily-selected title or word
symbol "Iron City," used in connection
with the words "John & Co."

We are indebted to Mr. A. N. Parlin,
treasurer of the Magee Furnace Company,
for a number of castings showing what good
work can be done with cast iron when all the
conditions are favorable. The most remarkable
of these sample castings is one on which
in a space less than 7x12 inches, are the
obverse and reverse of the Centennial medal,
a medallion representing the first Congress
in session, and the full text of the Declaration
of Independence, with fac-similes of
the autograph signatures of the signers. The
text of the Declaration is in raised letters,
somewhat smaller than the type in which
this article is printed, but every word is
clearly legible and nearly every letter clear
and distinct. Every part of the casting will
bear the closest examination—microscopic,
indeed—and its perfection of detail is sur-
prising. Among the others are a variety of
oval and oblong panels, with figures in high



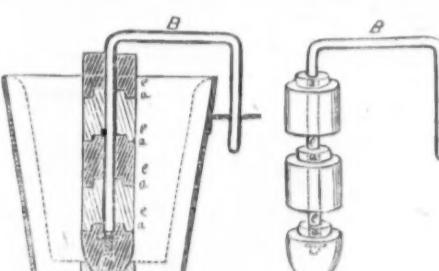
ing worn rails to flat or bar iron, which
consists in gradually reducing, in rolls, the
metal forming the head and flange of the
rail without confining the web, and forcing
a portion of the metal into the web and to
either side of the rail, forming a bar thicker
than the web and wider than the rail.

2. A pair of rolls having collars or bear-
ings B C D and grooves e f.

STOPPING-SLEEVE.

To A. J. Haws, Johnstown, Pa.—June 18.—
The stopper for steel ladles, consisting of
the rod B and the short perforated baked-

relief. The panel containing the Declaration
of Independence was taken from an electro-
type; the others are very perfect reproduc-
tions of German bronzes. They were made
without especial care, using the same sand,
the same iron and the same labor employed
in making the ordinary stove plates. They
are not, perhaps, as smooth as the remarkable
castings exhibited in the Russian de-
partment of the Centennial, but they are
very extraordinary for castings made under
the same conditions as stove plates, and are
certainly the best American castings we



cl



USE THE BEST.

NEW



THE NEW AMERICAN FILE COMPANY have the exclusive right to use the Bernot process for cutting Files. By this method all the advantages of hand cutting are secured, together with an accuracy unattainable in hand work. They are the only manufacturers who employ machinery for testing Files and Steel.

NEW AMERICAN FILE CO., Pawtucket, R. I.

AUBURN FILE WORKS,
Superior Hand-Cut
FILES AND RASPS,
MADE FROM IMPORTED STEEL. EVERY FILE WARRANTED.
FULLER BROS., Sole Agents,
89 Chambers and 71 Reade Streets, N. Y.

Granted for



McCAFFREY & BRO.,
Pennsylvania File Works,

Fourth St., north of Columbia Ave., Philadelphia, Pa., U. S.

Superior Goods.

FILES &

RASPS,

Established 1858.

Best Cast Steel.

HAND-CUT. Manufactured by
JOHNSON & BRO.
No. 1 Commercial Street, Newark, N. J.

ESTABLISHED 1850.
Chas. Spruce & Co.,
Manufacturers of **HAND CUT**
FILES AND RASPS.

Every File warranted.
CHALMERS & MURRAY,
Sole Agents, 76 Reade St., New York.

SPENCER & UNDERHILL,

84 Chambers St., N. Y. Agents for
American Screw Co.'s Wood, Machine and
Rail Screws, Stove and Tire Bolts, Rivets, &c.
O. Ames & Sons, Shovels, Spades and Scops.
A. Field & Son, Tacks, Brads, Nails, &c.
G. F. Warner & Co., Carriage Clamps.
We have also on hand a general assortment of Hardware

McCAFFREY & BRO.,
Pennsylvania File Works,

Fourth St., north of Columbia Ave., Philadelphia, Pa., U. S.

Silver Medals.



Domestic and foreign buyers who are desirous of handling a superior File or Rasp should send us their orders. Gentlemen visiting the Exhibition Universelle in Paris are invited to examine our exhibit at D 3, American Section.

Steam and Frost prevented on Show Windows.



REVOLVING VENTILATORS

For everything (and every size), from a hat or cap to an exhibition building.

Kitchens, Laundries, &c. ventilated without draft. Durable, strong, without rivets or solder. Oiled for six months. Each one has six cases. Retail price, size six inch diameter, \$1.00 and upwards; apparatus with which any one can cut circles in glass, 15 cents each.

Protective Ventilators avoid drafts, exclude dust, dampness, malaria and germs of disease; adopted by hospitals, schools, institutions, &c.; applied to any window or room.

Prof. A. L. LOOMIS, M. D., University of City of New York, writes as follows:

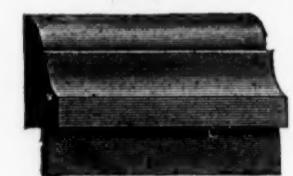
"From my personal experience and that of my patients, who have used your Ventilator during the past six months, I am convinced that your method of removing dust, impurities and dampness from the atmosphere is the best which has as yet been proposed. By it the air in an apartment can be constantly changed without causing drafts. I would especially recommend its adoption in sick rooms, sleeping apartments, nurseries and school rooms."

Air Filters and Moisteners, placed over hot-air registers of furnaces, &c., prevent dust and supply steam filtered air. Price and dimensions and mode sent on application.

The "Economy" Molding Weather Strip is perfect for every room. By enlarging edge of rubber or felt, and making slot in molding to correspond (see engraving), we save all *after expense* of molding. Once purchased it will last a lifetime, becoming smaller, &c., but only to be renewed by taking off piece out of either end and fitting, and sliding in a new piece. By this method of securing rubber all uncertainty of *fastening on* or *undoing* of glass or tacks is overcome.

It is made with enlarged edge and instructions to enable Car Manufacturers, Carpenters, Builders and far off trade to make slots in Sashes, Doors, Moldings, &c., and thus make perfect Weather Strips.

No. 6.



BRACHER VENTILATOR CO., No. 3 Park Row, New York.

Extension Cylinder Night Latches.

KING'S PATENT, June 28, 1877.
Cylinders adjustable for doors from $1\frac{1}{4}$ inch to 2 inches.

FRANCIS MANY,
143 Chambers St., New York.

"Common Sense"

MOUSE TRAPS,

For Home and Export Trade.

BEST IN MARKET.

RIPLEY MFG. CO.

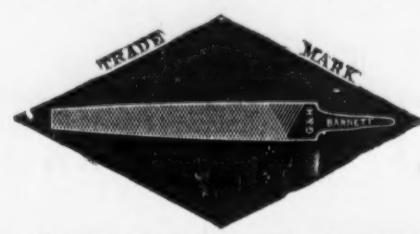
Unionville, Ct., U. S. A.

Manufacturers of

House Furnishing Hardware.



Black Diamond File Works.

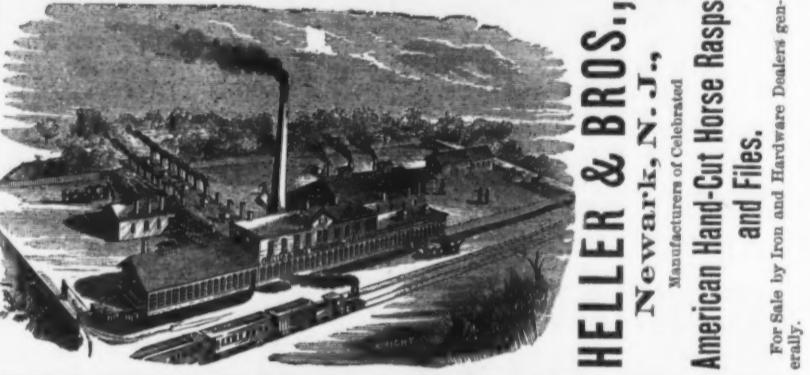


Awarded by Jurors of Centennial Exposition, 1876, for
"VERY SUPERIOR GOODS."

G. & H. BARNETT,
39, 41 & 43 Richmond St., Philadelphia.

CHARLES B. PAUL,
Manufacturer of **HAND CUT FILES.**

Warranted **CAST STEEL.**
187 Tenth Street, Williamsburgh, New York.
Established 1863.



HELLER & BROS.,
Newark, N. J.,
Manufacturers of Celebrated Horse Rasps
and Files.

For Sale by Iron and Hardware Dealers generally.

ESTABLISHED 1848.



C. T. DRAPER & CO.

Sing Sing, N. Y.

Manufacturers of **SUPERIOR**

HAND CUT

FILES and RASPS.

Made from Best
ENGLISH CAST STEEL.
Quality guaranteed by written warranty
when required.

AUSABLE HORSE NAILS

POLISHED OR BLUED.

HAMMERED AND FINISHED



The Ausable Nails
Are Hammered Hot,
And the Finishing and Pointing are
Done Cold,

Thus Imitating the Process of Making Nails by Hand.

Quality is **Fully Guaranteed.**

For Sale by all Leading Iron and Hardware Houses.

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4 Warren Street, New York.

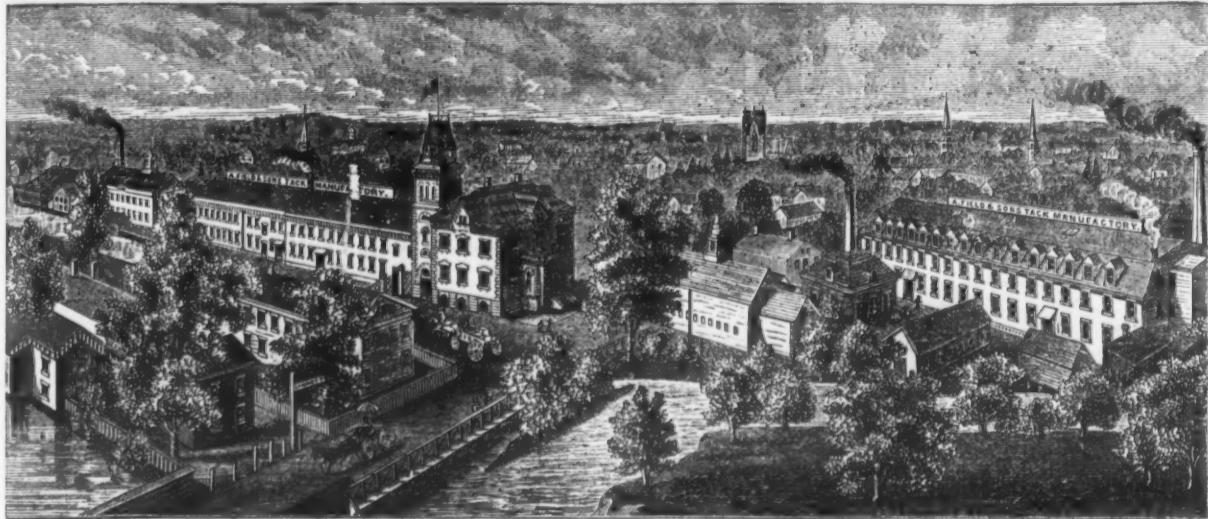
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THE D. R. BARTON TOOL CO.,

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Shoe Nails, Fine Two Penny and Three Penny Nails, Channel, Cigar Box and Chair Nails, Leathered Carpet Tacks, Glaziers' Points, Etc.

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Any variations from the regular size or shape of the above-named goods made from samples to order.

Hoisting Machinery

MANUFACTURED BY

CRANE BROTHERS MFG. CO.,

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The Upright Family Scale

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Manufactured by
JOHN CHATILLON & SONS,
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Manufacturers of

MEASURING TAPES.

Of Cotton Linen and Steel.

For all purposes for which Tape Measures are required.

Only manufacturers of

Paine's Patent U. S. Standard Steel

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FINE TEMPERED STEEL SPRINGS.

FINE TEMPERED STEEL BAND SAWS.

From 1/8 inch wide upward. Warranted tougher than

any other Band Saws. Catalogues on application.

PRIZE MEDALLISTS:

London, 1862; Oporto, 1865; Dublin, 1865; Paris, 1867; Moscow, 1872; Vienna, 1873, and only Award and Medal for Self-Coiling Steel Shutters at Centennial Exhibition, Philadelphia, 1876.

CLARK & CO.,

ORIGINAL INVENTORS AND SOLE

PATENTEES OF

Noiseless Self-Coiling Revolving

STEEL SHUTTERS,

FIRE AND BURGLAR PROOF.

Also Improved

Rolling Wood Shutters

Of various kinds. Clark's Shutters are the **Best** and **Cheapest** in the world. Are fitted to new Tribune Building, London, Library, Divan and Hudson's Bay Co.'s Building, Transatlantic Steamship Co.'s new Dock, American News Office, &c., Poor County Court House, Mt. Vernon, Holt County Court, Oregon, Mo. Also to buildings in Boston, Cincinnati, Detroit, Janesville, Wis., Baltimore, Canada, &c. Have been for years in daily use in every principal city throughout Europe, and are endorsed by the **Leading Architects of the World.** Office and Manufactury,

162 & 164 West 27th Street, N. Y.

Copper, Bronze and Iron.

Although we wish to speak chiefly concerning the execution of small objects in metal, it may not be improper to remark that the general employment of iron in modern days for the purposes of construction in buildings is owing to its strength, elasticity, toughness and durability, qualities which obviate many difficulties otherwise insuperable. On the other hand, great care is required in order to avoid the violation of the laws of good taste and proportion. Architects cannot but use iron largely in many buildings, but no ornament peculiarly identified with stone or marble should be introduced, nor any construction in iron which could be better executed in another material. A needless display of strength is as objectionable as weakness, and ironwork should never be obtrusive.

The sacred writings contain many references to the very early employment of various metals for domestic use and personal ornaments. We read in the Pentateuch of the riches of Abraham; of the jewelry offered to Rebecca; of the cup given by Joseph to his brother; of molten and graven images; of iron tools, beaten work, brazen vessels and the like. The ancient Egyptians were skilled workers in metal, and so also were the Assyrians.

Classical writers, Greek and Latin, are full of references to and descriptions of numerous works in metal. Armor and weapons, it need scarcely be said, were among the most frequent objects, and naturally would advance in merit and beauty of workmanship from the plain spear-head, hatchet, or shield of primitive ages to the period of the best Greek art. The Egyptians and the Greeks had some means of hardening and tempering their instruments of bronze with which we are unacquainted. No example as a work of art is to be found in any collection more exquisite than two portions of the fittings of a breastplate or a cuirass in the British Museum. These fragments represent two groups in very high relief, the subject of each being a combat between a Greek warrior and an Amazon. In both groups the Amazon has fallen on one knee; the antagonist kneels against her side, grasping her hair with one hand. The relief is so prominent that some of the most salient parts, the hands, the knees, and some parts of the draperies appear almost to be detached from the ground. In the heads the plate is reduced to the thickness of a sheet of writing-paper, and on the reverse are cavities nearly an inch deep. These fragments have been long and deservedly celebrated as the finest existing examples of such work. They were found in 1820, in Lucania, in southern Italy. In 1833 they were purchased for £1000 for the British Museum by a subscription, to which the trustees contributed £200. The size of each fragment is about 6 by 7 inches.

Bronze is an alloy much harder than copper, and was employed before the method of working iron was understood, and has the important property of attaining various degrees of hardness, according to the rate of cooling from the fused state. When rapidly cooled it is soft; when slowly, hard. Thus tools of bronze could be made capable of fashioning the same metal in a softer condition. The Phoenicians in very early times, perhaps a thousand years before the Christian era, traded largely with England, and taking home the mineral ores from Cornwall and Devon, probably supplied the Eastern nations with the necessary materials. A systematic analysis of the bronze weapons and works of art of all periods which are still extant, found in different localities, would doubtless throw great light upon this important branch of ancient and medieval industry.

The term bronze has been generally adopted by archaeologists to designate a mixed metal composed chiefly of copper with an alloy of tin, which latter is generally found to range from 8 to 10 per cent. Copper ores are more or less abundantly distributed in almost every country of the world. Cyprus seems to have been one of the earliest sources of this metal used by the ancients; but the mines of Spain, Anglesea and Cornwall were also known to them. We have abundant proof that the Romans worked copper mines in England and Wales, their tools and stamped cakes of the metal having been found. Ficks, bronze cells and wooden shovels of Roman and earlier times have been discovered in the stream tin workings of Cornwall. By the melting together of these two ores, copper and tin, bronze is produced differing in color from either of the constituent elements, as also in other qualities. In place of metals, the one white the other ruby color, we obtain a closer substance of a golden brown.

In Britain and in Ireland celts, or axes, swords and other weapons were made in great quantities in extremely remote and even prehistoric times. Many of the examples which have been discovered in excavations and in old burial places are of good workmanship and design. The collections of the British Museum and of the Royal Academy possess some admirable specimens. A few of the molds from which the objects were cast have also been found. Before the art of casting was discovered statuary were formed of hammered plates, fastened together by rivets. An intermediate improvement was introduced, it is said, at Chios, by which the pieces were soldered instead of being riveted. The earliest cast pieces were sold.

It may be well here to give, as briefly as possible, a description of the usual process adopted for casting in bronze. When lightness is requisite and economy in the use of metal, statuary and other objects are not made solid, but are cast over a central core. This is first built up to a rude outline of a material composed generally of modeling clay mixed with pounded brick and plaster of paris. When fashioned it is carefully dried and the last moisture driven out by baking in an oven. Upon this core, which in the case of a large statue is further supported by iron bars, modeling wax is overlaid of the required thickness. Upon this wax the sculptor works, and the statue leaves his hands in wax, to be replaced by bronze. Outside this the mold is formed, and the greatest care is necessary that every minute detail shall be filled in

with the composition and without the slightest disturbance or abrasion of the finished waxen surface. The mold is usually a mixture of dried clay and pounded crucibles with some plaster-of-paris and ground down with water to the consistence of cream. Layer upon layer, thickening as each gradually dries, is cautiously placed upon the mold, so that no air is left in bubbles; afterward upon the outside is formed a stouter coating of coarser quality to sustain the inner mold and to bear the weight of metal. Thus prepared, after slow drying, the whole is firmly fixed within an oven, and the mass is heated until the wax within has flowed out in a liquid state from every corner. The core and mold are kept in their proper position by means of small rods of bronze, which had been previously inserted in the core, passing through the wax, and with the other ends embedded in the mold. The liquid metal is then tapped from the furnace and poured steadily into the mold, filling every line and detail which the wax had occupied. After cooling, the mold is carefully broken away, the core raked out and all superfluous metal, the connecting rods, and other rough parts removed. Then the statue is complete; not as the artist left it in wax, but in enduring bronze.

The use of bronze in sculpture is of very high antiquity. An Egyptian figure in that material is mentioned by Sir Gardner Wilkinson with an inscription containing a date more than 2000 years before Christ.

American Goods in Scotland.—The following comes from an intelligent Scotch correspondent: American enterprise is showing itself in this country in a variety of ways. Every grocer's shop shows a stock of canned goods equal to any "cash grocery" in New York or New Jersey. Peaches, apples, pears, deviled meats, corned beef, sausage meat, chicken, tongue, and, indeed, everything put up in cans with you, can be had here at almost the price charged in your good retail stores in New York or Brooklyn. The importation of American cattle—alive and dead—is increasing, live beasts being, however, the great feature. Several droves were bought in Glasgow lately, sent by rail to Aberdeen, killed and dressed for the London market, shipped thither, and sold as Aberdeenshire fat cattle, and, I am told, yielded a very fair margin to every hand they passed through. We buy good rolled bacon here in lumps at 4 pence per pound. It pays a retail profit, a wholesale commission in Glasgow, freight, and shipping profit in New York. Querry, after allowing for curing, packing, and railroad tolls, how much is left for the pig-raiser? American furniture is coming to the front too. Our grand new hotel has all its bed-rooms furnished direct from American factories. Garden and field implements are cutting out the Sheffield products; even stoves are beginning to dawn upon the native mind; but for all that the "British workman" stands like the dog in the manger, barking at the capitalist who wishes to introduce improvements in machinery or lengthen the day from 9 to 10 hours. He keeps up combinations for his "rights"—commonly called trade protection societies—strikes on the slightest departure from what their rules and regulations demand, shuts his eyes to the advances made by our cousins over the way, and forgets that they are almost next door, working the same machinery 11 hours that he refuses to run more than 9. He trusts to his union, while with you the workman trusts to his superior skill and activity for his reward. Our unions have ended individual ambition, and the best workmen are content to herd along with the drones because they are all paid alike.

Manufacturing in French Prisons.—There are twenty-one central prisons in France for prisoners with sentences of five years and over. The cellular system is adopted in prisons for the detention of prisoners not sent up for more than a year and a day, but in the central prisons as many as 100 men sleep in one ward, certain of their number being responsible for the preservation of order. The dormitories are lighted, and there are openings from the galleries through which the guards may inspect them. By day the men work in *ateliers*, fifty or a hundred in each. Shoes, chairs, woven fabrics, buttons, umbrellas-ferrules, Chinese lanterns, &c., are manufactured, and such light work as glossing paper, sewing copy books and making hair ornaments is done. The work is let to contractors by taiff fixed by the local Chamber of Commerce, to prevent any undue competition with free labor. Half of the profits of the prisoner's work goes to the State; he is allowed to spend a quarter in procuring special articles of diet, &c., and the remaining quarter is paid to him on leaving, so that a discharged convict often finds himself with from \$100 to \$300 cash capital. A large proportion of the prisoners use this in setting themselves up in trade or in procuring passages to other lands. These rewards of industrial labor, together with the industrial training itself, constitute together the main and tolerably effective counterbalance to the otherwise grave evils of association. The element of hope is always prominent in French prisons and it is the sheet-anchor of their administration. A visitor to La Sante, at Paris, observed in the first cell he inspected a table on which lay a pipe of tobacco, a half bottle of wine and a novel.

It is asserted on apparently good authority that the Superior Commission of the International Exposition has resolved to prolong the Exposition to the 20th of November, in order to give opportunity for the sale of the exhibits, and that the drawing of the lottery, the prizes in which include many of the articles on exhibition, will also be postponed to the 20th of November. Most of the foreign exhibitors are at present disposed to begin packing up on the day originally designated for the closing of the Exposition—the 1st of November. The influx of visitors is again very large, all the hotels and lodging houses being full.

The eruption of Mount Vesuvius is increasing. The base of the new cone is now covered with lava, which is streaming down the sides of the mountain.

ANSONIA CORRUGATED STOVE PLATFORM

Manufactured by

Ansonia Brass & Copper Co.
Office, 19 & 21 Clif Street,
NEW YORK.

The Ansonia Corrugated Stove Platform with its heavy flared open border, is believed to be the best. Platform offered to the trade. As seen in the illustrated section herewith it requires no nailing to keep it in place or to prevent it from turning up at the edge; while the metal is of sufficient thickness to require no lining.

The low price, superior quality and fine finish of this Platform will be readily acknowledged. Packed 24 in a case.

Send for price list.

ANSONIA Bronzed Fire Screen, With Ornamented Moldings.

PATENT APPLIED FOR.

The Portable Bronzed Fire Screen or *Shield*, as shown in the illustration, is especially designed for the safety and protection of walls, furniture, woodwork, paper or varnish from heat. Being constructed of metal, with firm and substantial edges, carved in form to stand alone, it may be easily adjusted to any position about a stove, before a grate or fire place. The demand for something useful, durable and ornamental as a Fire Screen has long been felt, and having finally accomplished the desired result, we are prepared to fill all orders promptly.



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UNION CHAIN WORKS, REITER & MORTON, Pittsburgh, Pa.,

Manufacture all kinds of

Coil, Cable, Crane, Railroad, Wagon and Agricultural Chains,
From Best Standard Brands of Iron.

Our Chains are all thoroughly tested and warranted, and will be found equal to the best of either home or foreign make.

Prices the very Lowest.

BROWN & SHARPE MFG. CO.

Providence, R. I.,

MANUFACTURERS OF

MACHINERY & TOOLS.

Gears Cut and Index Plates Made and
Drilled to Order.

PATENT CUTTERS FOR THE TEETH OF GEAR WHEELS

can be sharpened by grinding without changing their form. Cutters made on this plan will outlast many of the old form, with the advantage of being always ready for use. If the cutter becomes dull before a wheel is completed, it can be taken out, sharpened and returned to its place in a few moments without risk of altering the form of teeth to be cut. Cutters for milling any irregular form made to order on the same plan. Parties having occasion to use mills for irregular shapes on sewing-machine, gun or other work, will readily see the advantage such cutters possess over those in general use, both as regards economy and convenience. Descriptive circular with price list sent by mail on application.

RHODE ISLAND HORSE SHOE CO.,

OFFICE, 81 Canal Street, Providence, R. I.

WORKS at Valley Falls, R. I.

Manufacturers of

PERKINS and RHODE ISLAND PATTERNS OF

HORSE AND MULE SHOES.

RUSSELL & ERWIN MANUFACTURING COMPANY

Manufacturers of HARDWARE.

FACTORIES, - - - - NEW BRITAIN, CONNECTICUT, U. S. A.

MANUFACTURERS' AGENTS AND DEALERS IN GENERAL HARDWARE AT OUR

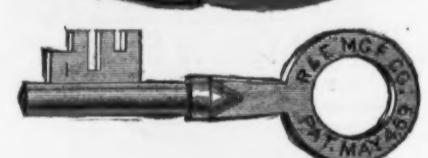
WAREHOUSES: NEW YORK, 45 & 47 Chambers Street; PHILADELPHIA, 425 Market Street; BALTIMORE, MD., WM. H. COLE, Agent, 17 South Charles Street.



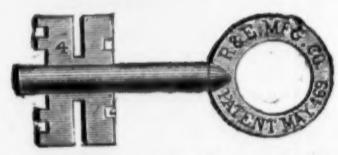
Steel Key Pad Lock, No. 1219.



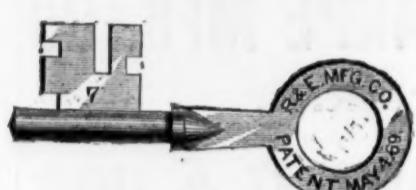
Flat Steel Key Pad Lock, No. 421.



Steel Key Pad Lock, No. 1213.



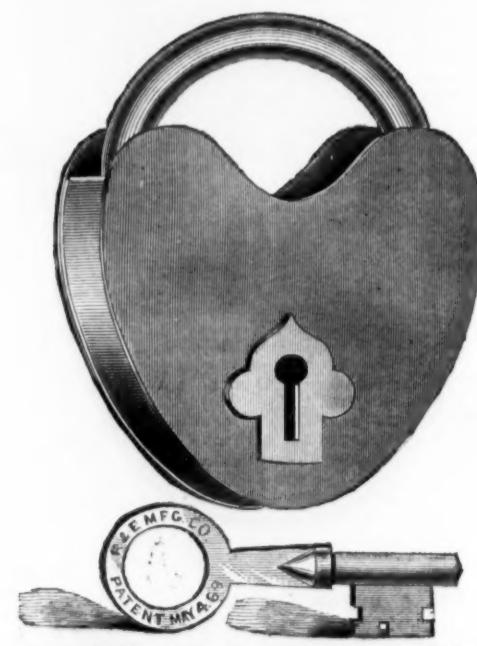
Steel Key Pad Lock, No. 1220.



Steel Key Pad Lock, No. 1212.



Polished Malleable Iron Key Pad Lock, No. 230.



Steel Key Pad Lock, No. 1200.



Steel Key Pad Lock, No. 1206.



Steel Key Pad Lock, No. 1203.

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FRIEDMANN & LAUTERJUNG,
Manufacturers of PEN AND POCKET CUTLERY,
Solid Steel Scissors, Shears, Razors,
Russia Leather Straps, Hones, &c.
Sole proprietors of the renowned full concave patent

"ELECTRIC RAZORS,"
And the "ELECTRIC SHEARS." Nickel Plated
Bows.
Agents for the BENGALL RAZORS.

AMERICAN TABLE CUTLERY, BUTCHER KNIVES, &c.
1 Chambers and 73 Reade Sts., N. Y. 423 N. Fifth St., ST. LOUIS, MO.

MERIDEN CUTLERY CO.

The Oldest Manufacturers of Table Cutlery in America.

The "PATENT IVORY" HANDLE TABLE KNIFE.

EXCLUSIVE MAKERS OF THE

CELLULOID

HANDLE FOR TABLE CUTLERY. A most beautiful and perfect substitute for Ivory. Also makers of all kinds of TABLE, BUTCHER AND HUNTING KNIVES.

Illustrated catalogues with prices sent to the trade on application. 49 Chambers St., New York.

**THE LAMSON & GOODNOW
88 CHAMBERS'S AMERICAN TABLE CUTLERY &c.**
MFG. CO. N.Y.
ESTABLISHED 1853.

AARON BURKINSHAW,
Manufacturer of Pen and Pocket Cutlery, Pepperell, Mass.
My Blades are forged by hand from the best Cast Steel, and warranted. To me was awarded the Gold Medal of the Conn. State Agricultural Society.

HALL, ELTON & CO.,
Electro Plated Ware, German Silver and Britannia Spoons.



THE "ORLEANS."

Factories, Wallingford, Conn.

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THE FRARY CUTLERY COMPANY,
FACTORY, BRIDGEPORT, CONN.

NEW YORK OFFICE & WAREHOUSE, with WIEBUSCH & HILGER HARDWARE CO., 84 Chambers St.

Manufacturers of all kinds of Table Cutlery.

FRARY CUTLERY CO.
PAT. JULY 4, '78, OCT. 10.
1876

FRARY CUTLERY CO.
PAT. JULY 4, '78, OCT. 10.
1876

The above illustrations represent their New Patent Screw Tang Fast Solid Handle Knife.

There is no question but that a solid handle knife is much more preferable than a scale tang. The great objection to their use hitherto is, that no solid wood handle has been placed on the market with the handle properly secured—no handle put on with cement will stand the wear and tear of every day usage. The cement will expand and contract with the action of heat and cold, and become loose, crack and come off, causing great prejudice against their use. This objection is overcome in our patent screw tang. A wood handle is secured to the tang of the knife or fork, and screwed firmly and securely in the handle and locked there by the bolster, making a very strong bond. The handle of the knife, when we speak of it, is not wood, glass, or bone. We manufacture a large variety of patterns, both Table, Butchers and Carvers, and furnish the patent handle nearly as low as the scale tang. We are prepared to furnish this line of goods, together with the scale tang and iron handle, very promptly, and very respectfully invite the attention of the trade.

HOLROYD & CO.,
Waterford, N. Y.



CLARK'S PATENT EXPANSIVE BITS

Made of JESSOP'S BEST CAST STEEL, and warranted superior to any other

Two sizes: Large Size Boring, $\frac{1}{4}$ to 3 inches; Small Size Boring, $\frac{1}{4}$ to $1\frac{1}{4}$ inches.

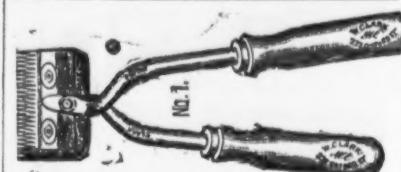
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WILLIAM A. CLARK,

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PATENT HORSE CLIPPER

Five styles. Fully described by our circular and price list, which we will send on application.

The genuine are stamped on both the wooden and metal parts, as shown in the illustration, as a protection against inferior imitations.

All repairs executed with care and dispatch.

JOSEPH S. FISHER,

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AGENT FOR

George Wostenholm & Son,

"Limited."

Washington Works, SHEFFIELD,

Celebrated I-XL Cutlery, Razors, &c.

AGENT FOR

WALTER SPENCER & CO.,

Steel and File Manufacturers,

Rotherham, ENGLAND.

CORPORATE MARK.

**JOSEPH SPENCER
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Granted 1777.

HERMANN BOKER & CO.,

101 & 103 Duane Street, New York,

SOLE AGENTS FOR THE

**GARDNER PATENT
POCKET KNIVES**

The assortment of Gardner's Celebrated Barlow Knives has been increased, and they are now furnished with Rubber, Bone, Stag and Wrought Iron Handles.

All of Gardner's Patent Knives are fully warranted.

NAUGATUCK CUTLERY CO.,

Manufacturers of FINE PEN & POCKET CUTLERY.

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Improved
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Tools.



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WAREROOMS,

29 Chambers St.,

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CORPORATE MARK,



Joseph Rodgers & Sons'

(LIMITED)

CELEBRATED CUTLERY,

No. 82 Chambers Street, New York.

F. & W. CLATWORTHY, Agents.

The demand for Joseph Rodgers & Sons' productions having considerably increased, they have, in order to meet it, greatly extended their Manufacturing Premises and Steam power.

To distinguish Articles of Joseph Rodgers & Sons' Manufacture, please see that they bear our Corporate Mark.

ESTABLISHED 1852.

NEW YORK KNIFE CO.

MANUFACTURERS OF SUPERIOR

Table & Pocket Cutlery,

WARRANTED TO BE MADE OF THE BEST

MATERIAL.

WALKILL RIVER WORKS,

Walden, Orange Co., New York.

THOS. J. BRADLEY, President.

ALFRED H. HILDICK,

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Importer of CHAINS, ANVILS, VISES, &c.

HILL BROTHERS & CO., WALSALL, ENGLAND,

GENERAL HARDWARE MERCHANTS,

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BALL'S PAT. SOLID STEEL SHEEP SHEARS.

These shears are manufactured for cheapness, durability and utility. They are made of one solid piece of steel from point to point, and cannot be broken in use either in the bow or at the junction of the shank and blade. Samples can be seen at above address, or sample lots furnished.

KRAUSS & HAHN,

Importers, Manufacturers and Dealers

In all kinds of

Cutlery and French Grindstones,

152 Centre, cor. Walker St., N. Y.

Ground sides Razors of all brands imported and

conveyed by steam power for concaving. Price for

concaving from \$3 to \$5 per dozen. Price list sent on application.

Wilson Bohannan,

Manufacturer of Patent

BRASS

Pad Locks,

FOR

Railroad Switches, Freight Cars,

and the Hardware Trade.

All sizes, with Brass and Steel

Keys, with & without chains.

Passenger Car Locks,

Bronzed, Nickel-Plated and

Japaned.

Patent Tubular Night Latches.

Will answer for Doors from $\frac{1}{2}$ to 2 inches.

BROOKLYN, N. Y.

Catalogues and Samples sent upon application.

The Future of Mexico and Trade Relations with the United States.

With his usual courtesy Signor Zamacona, Mexican Minister to the government at Washington, favored the representative of *The Iron Age* with full information concerning his recent tour in the West and the objects he is zealously endeavoring to bring about. His visit to Chicago, Pittsburgh and other Western cities had, he said, been highly satisfactory. He foresees in the future of his own country a development like that of the West. There is a similarity of resources, mining and agricultural. They have in Mexico the same fertile lands that he had seen in Illinois and Minnesota, capable of producing crops in equal abundance. The climate is rather milder. The urgent needs of the country at present are improved appliances in the various industries and adequate facilities for transportation. Railways can be built there to advantage, even where the population is very sparse. He noticed that railroads about Chicago were built in a wilderness, but produced a wonderful development. The trunk line from Vera Cruz to the capital has several important branches, of which one to Toluca, about 75 miles in length, is near completion, and there is a new line in progress across the State of Guanajuato, the system as a whole facilitating the distribution of merchandise in one direction, and the movement of agricultural products and minerals both from the North and South, especially in the State of Hidalgo.

There are two elements essential to the success of every industry, iron and coal, both of which Mexico has in exhaustless quantities. Deposits have lately been discovered in the States of Pueblo and Vera Cruz—the former may be considered the "Pennsylvania" of Mexico—also on the seaboard, but owing to the difficulty of transportation they are not worked. The coal mines in Vera Cruz are extremely rich, samples of bituminous sent to New York having sold for \$2 more per chaldron than the English cannel.

"We need help from the United States," said the minister with emphasis. The Mexicans must be supplied with all kinds of machinery employed in agriculture and mining, and must be assisted in learning their use. They have in the country several foundries and rolling mills, but they are small and of primitive construction.

Signor Zamacona predicts that a large and active trade between the United States and Mexico is sure to come. When asked concerning the prospects of continued tranquility in Mexico, Signor Zamacona said he had confidence in the disposition of the people, which is averse to political agitation and fully determined in support of the peaceful policy proclaimed under the administration of President Diaz. This sentiment was brought about by the drift of public opinion, which will not tolerate dissension, and which was manifested in its disapproval of Lerdo's proposed second term in the executive chair. Diaz seeks to incorporate in the constitution of the republic provisions against a second term.

With regard to ocean steam lines, the only lines existing are those to New York and to New Orleans, both subsidized. The rates from New York are too high, and the consequent embarrassment to trade appears in the fact that Signor Zamacona has been waiting two months to ship goods by a sailing vessel without any opportunity offering.

To introduce agricultural machinery into Mexico it is of the first importance that the governors of the several states cooperate, and Signor Zamacona has advised them to keep full lines of goods, and to maintain experimental farms to exhibit practically the results of improvements introduced into modern agriculture. If rates of freight can be lowered he is assured that there will be a large importation into Mexico of American machinery and implements. Labor in Mexico is abundant at from 25 to 30 cents per day, and the products afford generous returns.

The Mexican minister, in a word, believes that as Mexico is geographically our nearest neighbor and politically in accord with us, the two peoples are destined to become commercially one nation. While in New York he will endeavor to see, as far as practicable, manufacturers and others who are interested.

Iron Manufacture in India.—About eighteen years ago two attempts were made to introduce in India the manufacture of iron on the European system, the first being the Kumaon Iron Works, and the second similar works started by Col. Keatinge at Barwai, on the Nerbudda. In both of these cases it was expected that the abundant ore might be reduced to iron by the use of charcoal from the large forests surrounding the works, but it turned out, unfortunately, that the cost of production was too high for profitable working. The latest effort of English enterprise in this direction is the establishment of the Bengal Iron Works Company. Formed in the year 1874, when iron in England commanded prices unprecedentedly high, and nearly three times those now prevailing, this company selected for its operations a much more favorable situation. Purchasing a property on the Burakur branch of the East Indian Railway, central to the best collieries of the Bengal coal-field, and surrounded by abundant and easily accessible supplies of good ironstone, the Bengal Iron Works Company there established its works, and faced boldly the troubles and difficulties inseparable from the establishment of a new industry in India. They have been overcome, and the product of cast iron from the furnaces now working has, during the past nine months, been highly satisfactory. The iron is of very good quality.

The Wood Tariff Bill in France.—The foreign correspondent of *Iron* notes the following amusing version of the Wood bill by a French contemporary: "We may remark that the bill known to debaters in the White House at Washington as the Wood bill, is, perhaps, not quite accurately described by *La Hou*

H. D. SMITH & CO.,

Plantsville, Conn.,

Manufacturers of the

BEST QUALITY CARRIAGE MAKERS' HARDWARE.

Manufacture the Largest Variety of Forged Carriage Irons of Best Material and Workmanship.

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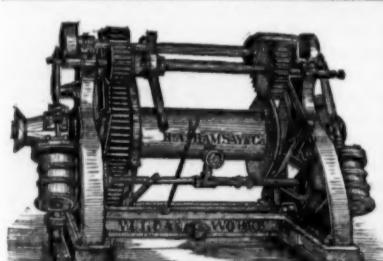
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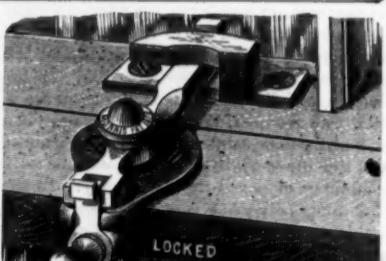


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AND
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Thirty-fifth Page.—Philadelphia, Buffalo, Chicago and Pittsburgh Hardware and Metal Prices.

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The largest miners' meeting ever held in Western Pennsylvania assembled at West Elizabeth on Wednesday of last week. Over 2500 miners were present. They agreed to adhere to their demand for 2½ cents per bushel for mining. As we have already

stated, the operators say there is so little demand for coal by reason of the yellow fever South that they are not particular about running their banks. Over 6,000,000 bushels of coal were taken to Ohio River ports on the recent rise, and this can be made available for the lower Mississippi if needed.

Our Trade with Hayti and San Domingo.

Since 1801, when France lost control of San Domingo—after Cuba, the largest of the West India Islands—that country has steadily declined in wealth, productiveness and commercial importance. The French had reared in San Domingo the finest colony they ever possessed, and the year in which the revolution broke out in France, 1789, there were in this magnificent island no less than 10,000 fine estates producing for export 1,500,000 cwts. of sugar, 77,000,000 pounds of coffee, 60,000 cwts. of cotton and 10,000 cwts. of Indigo, representing a valuation of \$30,000,000, and employing 400 vessels. In 1826 the 77,000,000 pounds of coffee had dwindled to 32,000,000 pounds, in 1837 to 31,000,000, and in 1876 to 24,000,000 pounds. With the first troubles sugar planting ceased, and in the portion of the island controlled by the negroes it has not since been resumed. Indigo and cotton have also ceased to be important products of the island. The coffee now produced is notoriously inferior and dirty, and sells for the lowest price of any of the mild coffees. But its culture is the easiest of agricultural pursuits, and this, with logwood cutting, is the principal dependence of the natives.

Those of our merchants who have had the courage and the means to trade with the Haytians in spite of their continual revolutions, have in the long run done remarkably well. As long as the people enjoy the double blessing of peace and an abundant coffee crop, and as long as coffee is tolerably high, everything in the trade goes on smoothly, and enormous profits are realized in some years to make up for losses in others resulting from revolution, extortion, confiscation and failures. In this country we seldom hear of failures among houses engaged in the Haytian trade, but in Europe they are very common, as at the greater distance it is impossible to meet unexpected contingencies by as prompt and decisive action as can be taken by New York and Boston merchants. Hayti and San Domingo are not a field which offers many inducements to the manufacturer seeking to extend the sale of his goods abroad by personal effort. He will do much better, in this instance at least, to seek trade through the established houses in this city and Boston.

Notwithstanding its present condition, its limited production and the indifference and indifference of its people, the country is one which possesses vast possibilities of future development. Hayti, the western portion, has an area of 9232 square miles, and San Domingo 20,595; together, 29,827 miles, the whole island measuring 400 miles in length and, on an average, 100 miles in breadth. Hayti was at first much neglected, since it produced but little of the precious metals, and in 1717 its census showed a population of but 18,410; it now counts 550,000, while San Domingo, although double the size, has but 250,000 inhabitants. Hayti has been divided into five provinces—the Western, Southern, Northern, North Western and that of Artibonite. San Domingo counts seven subdivisions—the provinces of San Domingo, Santiago, La Vega, Azua and Soiba, and the maritime districts of Puerto Plata and Samana. The largest city in Hayti is Port au Prince, with 20,000 inhabitants, and the largest in the Spanish portion, San Domingo, with 16,000 inhabitants. The island is mountainous throughout, but the Spanish portion possesses a magnificent plateau of great extent and fertility, famous for its tobacco crop. Railways have not yet been attempted in the island.

The import to Hayti in 1876 amounted to \$10,549,777, while there were exported \$11,003,086 worth of goods, principal among which were coffee, 23,767,717 pounds, costing \$2,852,160; logwood, 14,687,800 pounds, costing \$58,751; mahogany, \$19,920; cotton, \$17,700; lignum vitae, \$15,920, and coco, \$6877. There entered in the same year 305 vessels with a tonnage of 284,112, of which 185 were steamers measuring 260,000 tons. The departures were 296 vessels of 273,317 tons, 177 of which were steamers of 249,238 tons. No less than seven European and Anglo-American lines of steamers touch at the principal Haytian ports. The import into San Domingo in 1875 was \$1,745,654, while there were exported \$1,546,809 worth of goods, principal among which were tobacco, 11,613,230 pounds, nearly all shipped to Hamburg and Bremen; 7,152,015 pounds sugar; 264,179 pounds coffee; 115,680 pounds honey; 289,062 pounds wax and 1,375,790 feet of mahogany. There entered in the same year into the port of San Domingo City 162 vessels (of which 42 were English), with a tonnage of 45,297. The departures from that port were 110 vessels of 22,967 tons. The entries into the port of Porto Plata in the same year were 85 vessels (20 of which were steamers) with a tonnage of 25,699. The departures were 25,000 tons.

Our own trade with the island since the war has been as follows, the figures representing thousands of dollars:

	Im. port.	Dom. exp't.	For. exp't.	Total trade.
1864	2,033	4,273	312	6,618
1865	1,523	6,228	406	8,157
1866	1,240	3,597	230	5,067

1867 1,023 2,405 348 3,775
1868 843 3,024 307 4,174
1870 730 2,419 184 3,782
1871 1,050 2,618 274 4,021
1872 1,158 3,327 244 5,089
1873 2,260 4,834 437 7,531
1874 1,933 4,780 201 6,914
1875 2,158 5,350 123 8,021
1876 3,482 5,429 147 9,008
1877 3,958 4,859 106 7,805
Total 24,466 54,481 3,325 82,272

The principal articles of domestic production exported from the United States to Hayti and San Domingo during the past two fiscal years were:

Biscuit \$24,160 28,581
Flour 1,283,858 952,782
Other breadstuffs 18,004 10,132
Dried goods 250,019 286,248
Ditto 15,608 25,155
Manufactures of iron 12,532 1
Ditto steel 17,098 1 79,28
Leather manufactures 42,445 26,535
Petroleum 43,868 60,104
Lubricating oil 2,081
Bacon 51,658 46,436
Bacon 25,185 37,418
Fork 1,093,340 850,27
Butter 60,366 66,827
Cheese 14,085 18,921
Lard 205,189 152,513
Fish 311,272 672,132
Refined sugar 102,188 114,860
Leaf and man'ed tobacco 166,483 154,816
Lumber 196,706 165,035
Woodenware 121,911 48,867
Other goods 1,199,241 600,733
Total \$5,428,583 4,458,870

Under other goods there figured principally, in the two years given, matches, paints, paper, potatoes, sewing machines, soap, candles, carriages and glassware. Hayti received from this country in 1876 domestic goods to the value of \$4,732,724, and San Domingo \$605,859; together, \$5,428,583. In 1877 Hayti received \$3,814,566, and San Domingo \$644,304; together, \$4,458,870.

Referring to the general table showing the trade during fourteen years, it will be observed that the amounts set against the annual periods fluctuate widely. So far as our import is concerned the fluctuations arise from the greater or less yield of the Haytian coffee crop. Coffee is the principal means of payment in Hayti, and whenever the crop is deficient or prices not satisfactory, their export falls off materially. This also affects the import, for whenever the size and prices of the coffee crop permit the Haytians to indulge in luxuries they import on a liberal scale, unless there chance to be a revolution, which paralyzes everything. Little of the coffee remains here, labor being too high to pick it and remove the objectionable stones. Hence the large amounts we receive nearly all go to Havre, Antwerp and Hamburg, arriving there to be sold in transit or reshipped.

Taking a general view of the trade of both republics, they do a much larger business with the United States than with any European country, their principal wants being the necessities of life such as flour, provisions, petroleum, &c., which can be procured nowhere else so cheap or so quickly. Their civilization is of the crudest kind, and it would require half a century of unbroken peace and order to place them on the same plane as the better class of Spanish-American republics.

Some fifteen years ago the Spanish portion, San Domingo, temporarily acknowledged allegiance to Spain, but she was unable to maintain her hold on the Island and the Spaniards left in disgust. Under President Grant's administration the question was in due form placed before Congress, whether it was worth while to acquire the Spanish portion by purchase, but Congress being opposed to this plan of colonization the scheme was abandoned. These weak nationalities, being tacitly shielded from European aggression by themselves, are, like Mexico, left to shift for themselves as well as they can, and the prospect before them is not a bright one. All that we have to do, therefore, is to cultivate business relations with them to such an extent as their political status may permit us to do with a reasonable degree of safety.

Protection for Canadian Industries.

The result of the recent election in Canada, which can be interpreted only as a triumph of the protectionists over the free traders, and promises some important changes in the course of Canadian trade, is received with many expressions of uneasiness and alarm in the mother country. It is quite natural that Canada should be more influenced in this matter by the example of a prosperous next-door neighbor which has found protection of great and permanent advantage, than by the precepts of economists in a country from which she is widely separated and to which

another trial under more favorable auspices. At present the process cannot be said to be a commercial success, but it has elements that make it worthy a further trial. If the inventor can do nothing better than make pig iron with a consumption of only 1900 pounds of coal slack to the ton, he will have made a discovery of value for many parts of the country. We shall watch future developments with great interest, and shall give full details and drawings as soon as results are reached which can be accepted as conclusive.

Assignment, Exemption and Collection Laws of the Various States.

Since the repeal of the National Bankrupt Law the business community have a deep interest in knowing the provisions of the various State codes relative to assignments, exemptions, collection of debts, &c. We therefore present an abstract of these laws, which will be found of value for reference by business men :

MAINE.

By the repeal of the United States bankrupt law the old "grab law" is revived in the State of Maine. A debtor may assign all his property for the benefit of his creditors, but he is discharged from those debts only represented by holders who have signed the deed of assignment. The real and personal property of the debtor may be attached in commencing a suit. Married women are not liable for the debts of their husbands. Execution must be levied in thirty days after judgment, which does not constitute a lien on property except by levy, as there are no stay laws; \$50 worth of household furniture, apparel, a certain number of cattle and the necessary provisions being exempt. A homestead not exceeding \$500 in value may be exempted by filing a claim in the office where deeds are registered. As there are no usury laws, parties may contract loans at any rate of interest, although the legal rate is 6 per cent. Six years is the limitation for suits on bills, notes, &c.

NEW HAMPSHIRE.

In New Hampshire the law provides that a debtor may assign all his property for the benefit of assenting creditors, to be equally distributed among them. Those who do not assent to the proceedings (which do not discharge the debtor) still hold valid claims. The limitation for suits on bills or notes is six years. As the property of married women is held separately from that of their husbands, the former are not liable for the debts of the latter. There being no stay laws, executions in order to preserve attachments must be levied in thirty days after rendition of judgment, which does not constitute a lien on property except by levy. A homestead not exceeding in value the sum of \$500, together with household furniture and apparel to the amount of \$100, and tools of occupation, worth at most \$100, are exempt. Stockholders in corporations are liable only for the par value of the stock for which they have subscribed. Interest in excess of the legal rate of 6 per cent. is forfeited, but the fact that an excessive rate was taken does not vitiate the contract. The effect of the repeal of the United States bankrupt law will be to revive the old "grab law," as in Maine.

VERMONT.

In Vermont an insolvent debtor is not entitled to a discharge from his debts, although he has made an assignment for equal distribution among his creditors, nor does an assignment discharge an existing attachment. A judgment does not constitute a lien on property except by levy, which must follow the rendition of judgment within 30 days. Chattel mortgages hold against other creditors only if the mortgagor is in possession of the property. An important exception to this is found in the case of machinery actually in use, the chattel mortgage covering which can be recorded with the town clerk. The property of married women, being held separately, cannot be made liable for the debts of husbands. Exemptions of household furniture, stock and provisions up to \$200 in value are allowed, and a homestead of \$50 in value is exempt.

MASSACHUSETTS.

There is no assignment law in Massachusetts, and the State code does not recognize assignments. The repeal of the United States bankrupt law does not materially affect the situation in Massachusetts, as the insolvent law of that State is substantially the same. The limitation of ordinary debts is 6 years, but the period is extended to 20 years in the case of a note signed in the presence of a witness, if the same has remained in the hands of the original payee. Executions, which cannot be issued until four days after judgement, must be levied within the period of 30 days thereafter. Articles of household furniture, wearing apparel and provisions not exceeding in value the sum of \$300 are exempt from execution, as is also a homestead worth \$800, provided it is claimed upon the records of deeds or declared in the deed of land. As in the States named above, a debtor may be arrested upon affidavit of the creditor that the debtor intends to leave the State. Massachusetts has no usury laws, and any rate of interest may be contracted for. The legal rate is 6 per cent. In order to form a limited partnership a sworn statement of the amount of capital subscribed by the respective parties must be filed with the Secretary of State.

RHODE ISLAND.

In Rhode Island a debtor may make a voluntary assignment, and an attachment may be defeated at any time within 60 days by such an assignment. A compulsory assignment may be brought about by the petition of at least three creditors, holding at least one-third of the debts, asking the court to appoint a receiver. By the action of a recent law all creditors are brought in and their claims are discharged. The law exempts from execution a variety of personal property, including wearing apparel and working tools to the value of \$200, household furniture and provisions worth \$300 and books not exceeding in value \$300.

CONNECTICUT.

In Connecticut a debtor may assign his property for the benefit of his creditors, which vacates all attachments and levies of executions made within 60 days. A creditor holding a claim exceeding \$100, or a creditor of the State holding more than \$100 against a non-resident owning property in the State, may bring about a compulsory assignment. In either case the judge of the Probate Court appoints a trustee and commissioners to examine and report upon the claims. All the property of the debtor is put into the hands of the trustee. The court may discharge the debtor when he has paid 70 per cent. of the claims proved. The articles and property exempted are numerous. They embrace household furniture, wearing apparel, bedding, military equipments, pension money, tools and library to the amount of \$500, live stock and provisions worth \$200, a physician's horse, buggy, &c., and one boat for oyster or other fishing to the value of \$200.

NEW YORK.

New York has an assignment law by which a debtor may, for the benefit of his creditors, assign his property to an assignee, who must file a bond. This assignment must be acknowledged and recorded in the office of the clerk of the county. If the creditors sign a composition deed the debtor is discharged, which does not, however, release the claims of those creditors who have refused to sign the deed. The assignee realizes on the property of the debtor, and divides the proceeds among the creditors *pro rata*. Household furniture or library to the value of \$50 live stock and tools to the amount of \$25, and if the debtor be a householder, team and tools valued at \$150 in addition are exempt from execution, which may be proceeded with at any time within five years after judgment. If a claim for homestead exemption has been duly filed in the office of the clerk of the county in which the property is located, homestead to the value of \$1000 may be claimed. If interest beyond 7 per cent. is paid, both principal and interest is declared forfeit to the debtor.

NEW JERSEY.

In New Jersey the law provides for the assignment of a debtor's property to an assignee, who may realize upon it after filing a list of the creditors within three months after the publication of a six weeks' notice. Creditors not presenting claims obtain a share only after others have been paid in full. By proceedings under the act, creditors' claims are discharged whether they are residents or not. The exemption law secures for the debtor personal property worth \$200, and to a householder with family a homestead to the value of \$1000. The usury laws of New Jersey provide for the forfeiture of all interest above the legal rate of 6 per cent.

PENNSYLVANIA.

In Pennsylvania there is no compulsory assignment law, but a debtor may assign his property for the benefit of his creditors, who obtain a *pro rata* share of the amount realized on any claims proved before the last dividend from the estate has been paid. The only preferred creditors are employees, the maximum amount being \$200 if their services were rendered within a specific time before the date of assignment. As soon as a debtor has assigned his property no execution can be levied on it, but the fact that he has done so does not, however, discharge the claims of his creditors, the unpaid balance of the debt being still due to them, subject to a limitation of six years on ordinary suits. Although in Pennsylvania a married woman holds her property separate, she is liable for debts incurred by her for the support of the family in case her husband's estate cannot satisfy the debt. The creditors of her husband have also a claim on her earnings, which by law belong to him. If the owner wishes to take the benefit of the law he is entitled to an exemption of \$300 worth of real and personal property, all wearing apparel remaining his property. The law does not provide for a homestead exemption. Stockholders in corporations whose charters are now granted by the governor and the courts are individually liable to the amount of stock held by them.

DELAWARE.

Assignments in Delaware are not compulsory. In other respects the law is similar to that of Pennsylvania, and, as in that State, the debtor's voluntary assignment does not discharge him from the amounts not satisfied. No creditors are preferred. The exemptions are small in amount, being \$75 for single men and \$200 for the heads of families. As in Pennsylvania, no homestead is secured to the debtor by law. In general, corporations are chartered by the legislature, the term of the charter being only 20 years. The usury laws of the State prohibit a rate of interest greater than 6 per cent., under the penalty of loss of the entire amount loaned.

MARYLAND.

The repeal of the United States bankrupt law will have very little effect in Maryland, as the State law is substantially the same. A debtor, in assigning his property for the benefit of his creditors, may prefer one over another. There is no provision for a homestead exemption, but wearing apparel and tools are secured, together with personal property to the value of \$100. Unless a promise to pay has been given the period for the limitation of a debt is three years. A stockholder of a corporation can only be held liable for the unpaid balance of his subscription of stock.

WEST VIRGINIA.

The custom in West Virginia, which has no insolvent law nor any assignment law, allows a debtor to convey his property for the benefit of his creditors to a trustee, but the proceedings do not discharge him from the unpaid balance of the claims of his creditors without their consent. Under specified restrictions a homestead worth \$1000 may be claimed, and the head of a family may retain from a forced sale real or personal property which shall not exceed in value the sum of \$200. Interest above the legal rate of 6 per cent. cannot be collected under the law, but there is no penalty beyond the loss of the unlawful excess.

OHIO.

In Ohio there is a voluntary assignment law, under the provisions of which a debtor

may turn over his assets to an assignee in trust for the benefit of his creditors, whose claims are not discharged by the proceedings. The assignee must, after due notification, sell the property either at public auction or under certain restrictions at private sale, and make the first distribution before the end of eight months. Arrest for debt is possible only on an affidavit setting forth that the debtor is about to fraudulently realize, secrete or remove his property. The debtor may be discharged on a certificate from a commissioner of insolvents by transferring his property to him. In all cases employees are preferred to the maximum amount of \$100. The exemption law secures for mechanics, farmers, draymen and professionals men their tools, implements, stock, &c., to the value of \$100. The homestead law provides for the exemption of a homestead worth \$1000 to every family, or in its stead \$500 in personal property, which, however, is beyond the reach of a claimant if either wife or husband is in possession of a homestead. The law of Ohio does not permit a married woman to mortgage her estate without the consent of her husband, although otherwise the wife has full power over her property.

ILLINOIS.

In Illinois an assignee, who must file bonds for double the value of the estate as presented under oath in an inventory by the debtor to the county court, notifies the creditors by publication. Those who have failed to present and prove claims after three months' notice are debarred from a share in the dividends until the creditors who have entered claims are paid in full. Assignment proceedings do not discharge the debtor. Wearing apparel and personal property to the value of \$100 are exempt, together with a homestead worth \$1000. Stockholders in corporations are liable for the amount of stock subscribed but not paid for. Usury entails the loss of the entire interest, but by special contract to 10 per cent. may be collected.

INDIANA.

In Indiana if a debtor assigns all his property to his creditors and is able to obtain their consent to a discharge, he is released from further liabilities. A \$1000 homestead and \$300 worth of personal property, to be selected by the debtor, are exempt.

MICHIGAN.

The assignment law of Michigan permits a debtor to deliver his property for the benefit of his creditors and to obtain a discharge from his liabilities. Mechanics' tools and farmers' implements, valued at less than \$250, a specified number of cattle, furniture, library, &c., to the value of \$150 are exempt. The homestead law secures for an insolvent debtor a lot and house in a city, or forty acres of land in the country, provided their value does not exceed \$1500. The statute of limitations fixes six years as the time in which debts on accounts, notes or bills may be collected.

(To be continued.)

Scientific and Technical Notes.

In a paper read by Dr. J. L. Phipson, before the British Association at Dublin, he calls attention to a

NEW WHITE ZINC PIGMENT.

The basis of which is a sulphide of zinc. On submitting this new product to a careful examination it was found that it not only surpasses the old zinc white (oxide of zinc), but that it is superior in every respect to carbonate of lead itself. It is obtained by precipitating chloride or sulphate of zinc by means of a soluble sulphide. Sulphides of sodium, barium or calcium have all been used for this purpose, and special precautions are taken lest any iron that may be present in small quantities as an impurity in the zinc solution should be precipitated with the white sulphide of zinc. The precipitate being collected and dried is transferred to a furnace, where it is calcined for some time at a cherry-red heat, and carefully stirred so as to bring all parts of it successively in contact with the air. It is then raked out while quite hot into vats of cold water, where it is levigated, and afterward collected and dried. The result is a white pigment of exquisite beauty; its covering power when mixed with oil is greater than that of any substance hitherto discovered, being about 25 per cent. higher in this respect than that of the same weight of pure carbonate of lead.

According to analyses of this new product, made by Dr. Phipson, it consists of an oxysulphide of zinc, the composition of which varies somewhat according to the duration of the calcination and the exact degree of heat obtained. Hence, it is not an easy matter to get it precisely of the same composition at each successive operation. Nevertheless, this point is attained quite closely enough for all practical purposes. The best product appears to correspond very nearly to the composition $5\text{ZnS}_2\text{ZnO}$, but, occasionally, a somewhat larger proportion of oxide is produced. Of course a white pigment of this nature is not liable to darken in color by sulphurated hydrogen emanations, as occurs with white lead; but it has also the advantage of not proving prejudicial to the health of the workmen who manufacture or use it.

MECHANICAL EQUIVALENT OF HEAT.

The new result, confirming the earlier researches of Prof. Joule in 1850, gives 772.55 foot-pounds as the equivalent at the sea level, and the latitude of Greenwich, of the heat which can raise a pound of water weighed in *vacuo* from 60° to 61° Fah. in a mercury thermometer where the permanent freezing point is called 32 and the permanent boiling point of water is 212. The work at present hand is the more accurate investigation of the true position of the freezing point and the boiling point of the thermometer when cleared from the effects of the imperfect elasticity of the glass of which it is composed. The correction of the above equivalent which may thus accrue is not expected to be of considerable amount.

Prof. Everett, in his report of the labors of a committee of the British Association, describes a

NEW METHOD FOR OBSERVING UNDERGROUND TEMPERATURES.

To avoid the inaccuracies caused by the fluctuations of heated water in the bottom of open bore holes, a thermo-electric method for closed bore-holes was introduced. Two wires, one of iron and the other of copper, each covered with gutta-percha, are joined at both ends, where a portion is left uncovered. One junction is buried in the bore, while the other remains above ground available for observation. A current flows through the circuit composed of these two wires whenever the two junctions are at an unequal temperature, and the observer immerses the accessible junction in a basin of water containing a thermometer, and regulates the temperature of the water until he finds by a galvanometer that no current passes. He then knows that the temperature of the water, as indicated by the thermometer, is the same as the temperature of the buried junction. The operation involves the complete filling up of the bore, as several circuits are employed, their lower junctions being buried at different lengths.

Nitroglycerine, which is made by the admixture of glycerine with nitric and sulphuric acids, and subsequent washing to re-

move waste acids, is apt to decompose, even when cold water is used. In order to avoid deterioration, Mr. Frederick Mann of Koroit Creek, Victoria, has made the following

IMPROVEMENTS IN THE MANUFACTURE OF NITROGLYCERINE.

It consists in first crystallizing the nitroglycerine by freezing before attempting to separate it from the acids, and then separating such crystals from such acids by a centrifugal washer, such as is used for the separation of sugar crystals from molasses, or by any other of the machines now in use for separating a crystal from a liquid. The crystallized nitroglycerine thus obtained is then placed in cold water, when it liquifies and sinks to the bottom, from whence it can be drawn and used for any purpose.

The *English Mechanic* describes and illustrates a

NEW NUT-TAPPING MACHINE.

Patented by Mr. T. Mason, of Birmingham. The machine consists of the usual framework, with driving shaft and gear. It is fitted with a long box chuck, or hopper, in which the blanks are placed; the tapping tool is fixed at the lower end of this chuck and is started by means of a cam. As each nut is tapped the tool is withdrawn by means of a balance weight, freeing the nut from the chuck, when another blank falls into position for tapping, and so on until the chuck, or hopper, is empty. In front of the chuck there is a slide guide worked by a lever from the balance weight, which is to prevent the twisting or dropping of the nut from the chuck until the tapping tool is re-started.

G. Larsen gives the following method for SEPARATING COPPER AND ZINC BY SULPHURATED HYDROGEN

by precipitating one only. He moistens the precipitate of sulphurated hydrogen on the filter with hydrochloric acid of 1.05 specific gravity, through which sulphurated hydrogen has been previously passed. After moistening, the filter is washed with sulphurated hydrogen water.

In the Belgian Department at the Paris Exhibition, J. Montagne & Co., of Mons, exhibit P. Cucherat's patent

WIRE SPRING MACHINERY.

The wire is first seized by a pair of rollers, one of which has a groove and the other a corresponding milled projection. It is passed under a guide roll, the position of which may be adjusted according to circumstances, and is then carried between a second roller and a guiding sheet which throws it forward. The position of the guide roll determines the diameter of the spiral spring, while the deviation of the second roller and guiding sheet from a position parallel to the first pair causes the spring to become spiral. This deviation is automatically regulated, and the machine is so constructed that when a double spiral has been finished the wire is cut at the proper time.

The *Moniteur Industriel* states that A. Olivier-Matthey, of Neufchâtel, has succeeded in

REPRODUCING THE PHONOGRAPHIC RECORD.

which, it is well known, becomes indistinct after the phonographic plate has been frequently used. He attaches one end of a copper wire to the tin foil and the other to a zinc cylinder, which is placed in a porous cell containing water acidulated with sulphuric acid. The whole is then plunged into a saturated solution of sulphate of copper. After three days the deposit of copper on the tin foil is so thick that as many galvanoplastic impressions as are required may be taken from it, which are by far more durable and admit of unlimited reproduction.

A new material, exhibited in numerous applications at Paris, and which promises to become important, is the so-called

CORK LEATHER.

It consists of very fine slices of cork, which are placed between layers of any kind of cloth, to which they are firmly attached. Messrs. De Beerski & Co. have succeeded in preparing the slices so thin, pliable and sound that the cloth does not lose any of its softness and is not made appreciably heavier, while at the same time it possesses the advantage of being impervious to water.

In the *Berichte d. Deut. Chem. Gesell.* is a method for

PURIFYING PLUMBAGO.

given by Bessel. He mixes it with 1 to 10 per cent. of grease, petroleum or paraffine and boils it strongly in water. This causes the pure plumbago to rise to the surface of the water. It is skinned and dried.

Mr. George M. Hopkins has invented a very simple and delicate instrument,

THE MICRO-TELEPHONE.

It consists of two springs secured to a small base piece, each supporting at its upper end a piece of ordinary battery carbon. The two pieces of carbon are placed in light contact, adjustable by a screw passing through one of the springs at or near its center. The two springs are put in an electrical circuit in which there is a receiving telephone of the Bell type. When mounted on a sounding-board this micro-telephone will transmit articulate speech uttered in any part of a room of ordinary size; it will transmit the music of a piano and even the turning of the music may be heard.

Mr. McCook, member of the Academy of National Science of Philadelphia, has discovered

HOW ANTS DIST

AMERICAN SCREW CO.,

Providence, R. I.,

MANUFACTURERS OF MORE THAN 4000 VARIETIES OF PRODUCT,

AND INCREASING THE ASSORTMENT DAILY.

Machinery employed contains important inventions recently patented, and which are designed to produce Screws at a lower cost to the consumer than has ever been attained.

All goods are distributed through the Hardware trade, to whom a liberal discount will be allowed.

INTERNATIONAL EXHIBITION. PHILADELPHIA, 1876.

(No. 235.)

The United States Centennial Commission has examined the report of the Judges, and accepted the following reasons, and decreed an award in conformity therewith.

REPORT ON AWARDS.

PHILADELPHIA, November 8, 1876.

Product: Iron, Brass and Steel Screws, Tire and Stove Bolts, Rivets.

Name and address of Exhibitor: American Screw Company, Providence, R. I.

The undersigned having examined the product herein described, respectfully recommends the same to the United States Centennial Commission for Award, for the following reasons, viz: Being of a quality nearly approaching perfection, showing the highest attainment in this branch of manufacture.

G. L. REED, Signature of the Judge.

Approval of Group Judges.

Daniel Steinmetz,
Jas. Bain,
Chas. Staples,

G. L. Reed,
J. D. Imboden,
Dav. McHardy.

A true copy of the record. FRANCIS A. WALKER, Chief of the Bureau of Awards. Given by authority of the United States Centennial Commission.

A. T. GOSHORN, Director-General.

J. R. HAWLEY, President.



After forty years' experience we offer to the trade our Centennial Screws, patented May 30, 1876, as the best we have ever known.

The method¹ of manufacturing is also patented, and we are changing our machinery as fast as possible, to manufacture the improved article only. To introduce them, they will be sold at the same price as the old style screw.

The new screws will be packed in manila colored boxes with the new label covering end of box, and enlarged figures showing plainly contents.

To distinguish this screw we have adopted a trade-mark, which is also secured to us.

The accompanying engravings show the progress of making screw from the old blunt point to style now adopted.

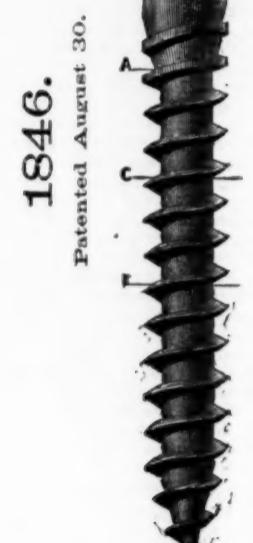
Experience has shown that the weak point of screws, as formerly made, is at the heel of the thread, where all



1776.

1846.

Patented August 30.



1876.

Patented May 30.

COVERED BY TRADE MARK.



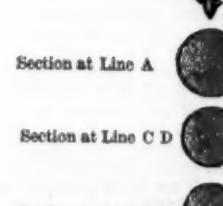
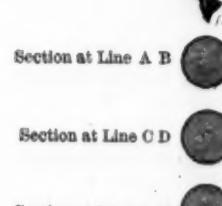
the strains of forcing the screw into the wood naturally concentrate.

To avoid the sharp angle existing in the old style of screws has been the aim of all manufacturers, but every expedient hitherto adopted has proved as objectionable as the evil complained of.

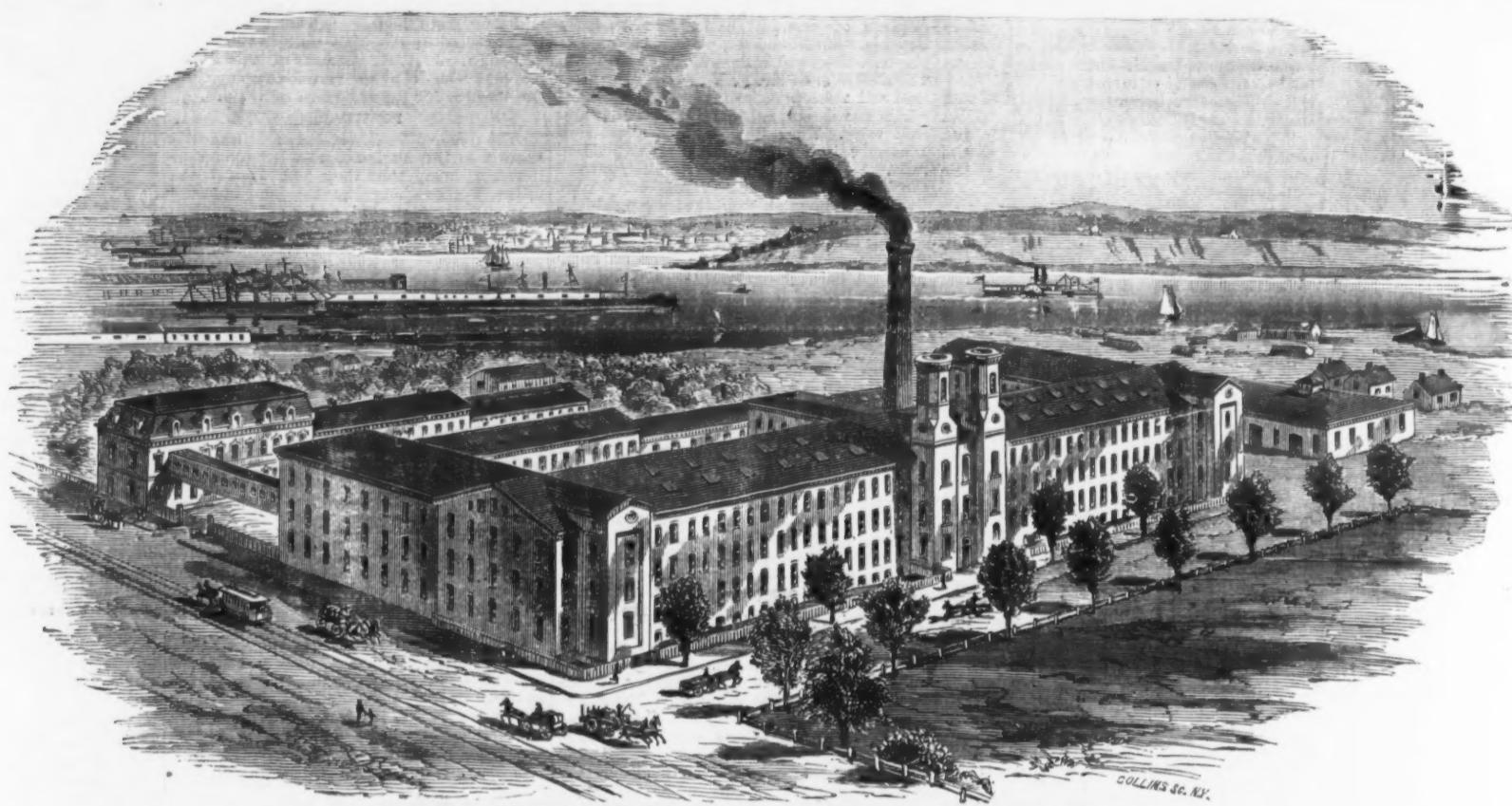
It will be seen in our new screw that not only is the sharp angle avoided, but the strength very much increased, as illustrated. See sections at lines.

CLAIM.

"A Pointed Wood Screw having the outer periphery of the thread upon its body cylindrical, while a portion of the body below the thread and near the neck is conical, the remainder of the body to the point being cylindrical, and yet having all the thread brought to an edge of a constant angle, without jogs in the paths between the threads, substantially as described."

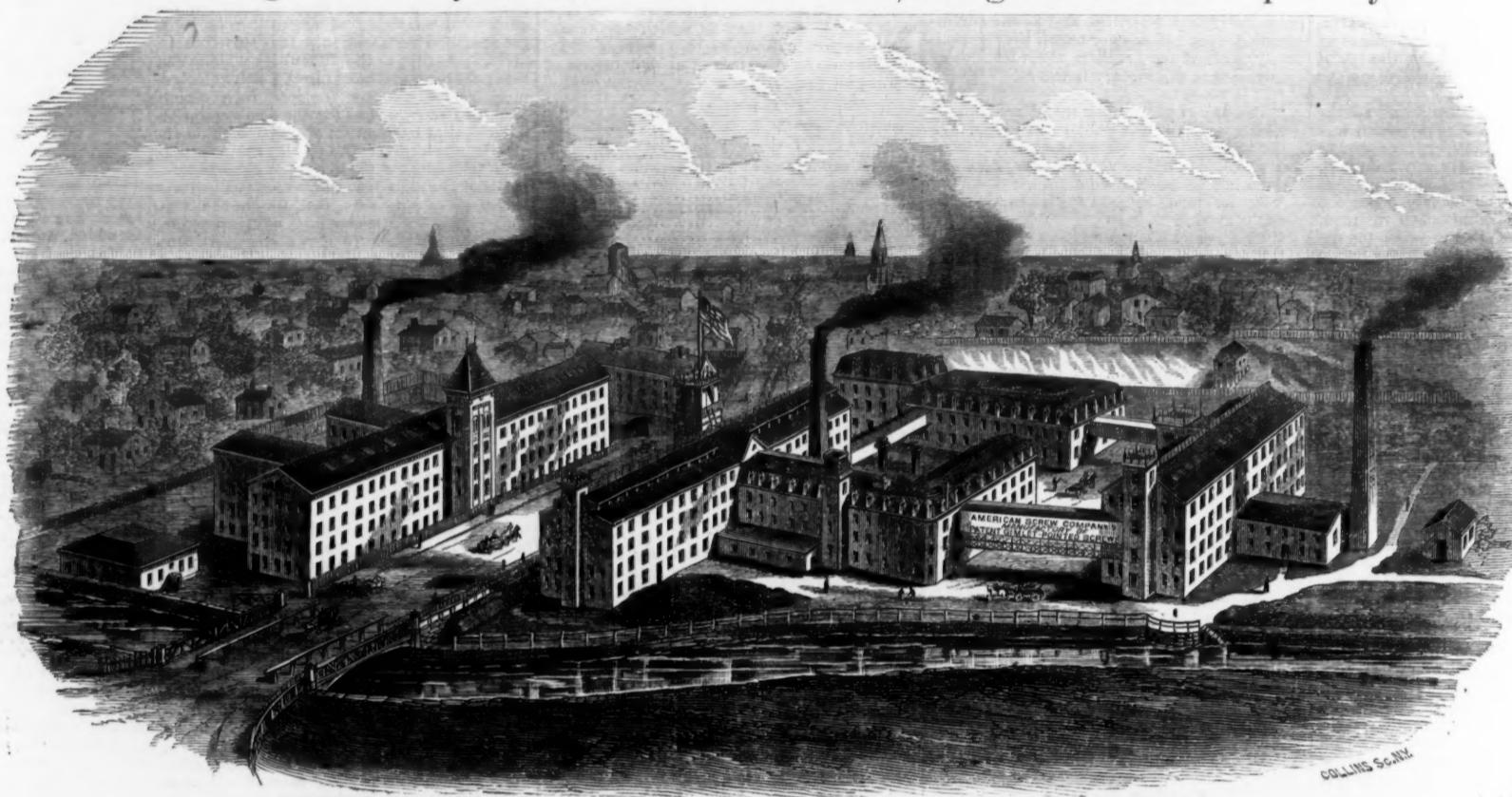


On the opposite page will be found illustrations of the various Works of the company.



NEW ENGLAND MILL.

Containing Machinery for the Production of 22,500 gross of Screws per day.



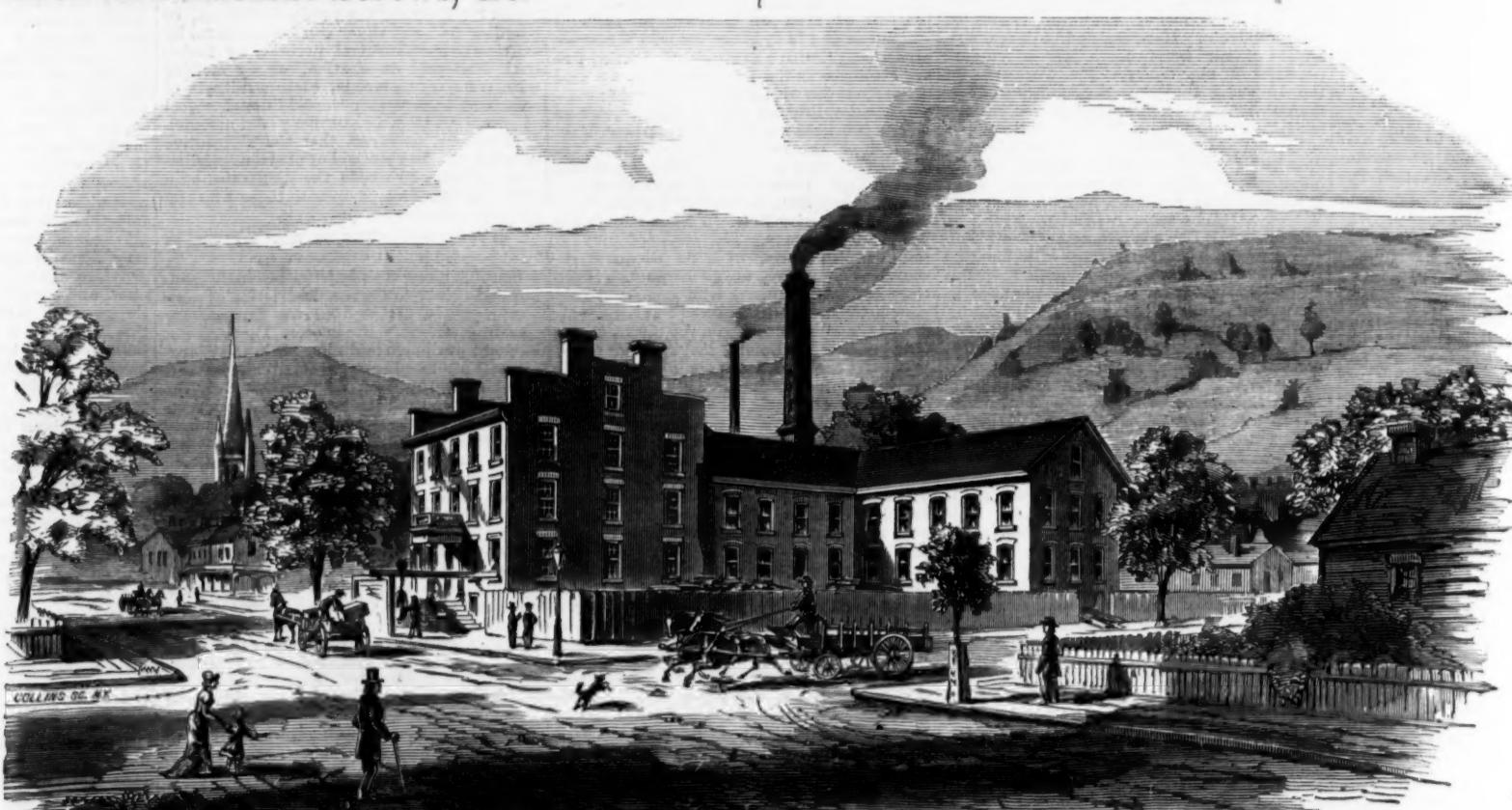
BAY STATE AND EAGLE MILLS.

BAY STATE MILL,

For the Production of Stove Bolts, Tire Bolts, Rivets, Lock and Machine Screws, &c.

EAGLE MILLS.

Capacity 22,500 gross Wood Screws per day.



WORKS AT DUNDAS, ONTARIO, CANADA.

Capacity, 4000 gross Screws per day.

THE PARIS EXPOSITION.

French Newspapers and the Exposition.

(From our Special Correspondents.)

THE IRON AGE.
B. 3, American Section Exposition Universelle, Paris, Sept. 11, 1878.

It is amusing to observe the different manner in which the various French journals treat every subject connected with the Exposition, according to which political party they belong to. This Exposition being the idea of the Republicans, and carried by Republican votes almost entirely, whatever is Bonapartist, Monarchical, or in any way anti-Republican has been its enemy from the commencement, opposing every step and making the best use of every opportunity for ridicule and hostile criticism. This Exposition is regarded as a Republican demonstration, while that of 1867 was considered an imperial fete, and the public and the press are divided into two opposite and hostile camps in championship of one or the other. This feeling even goes so far that the action of May 16 last year has been said by some to have had no other object than to disengage both foreign governments and French citizens from preparing for the Exposition—a very extreme opinion, but held by some. It thus happens that the organ of the government, the *Journal Officiel*, the Republicans now in power, takes pleasure in making the following comparison of the receipts of admission to the Expositions of 1867 and 1878 for the week included between Aug. 29 and Sept. 4 of each year:

"In 1867, the total number of visitors (including supplements for study hours and for admission to the gardens) was 287,319.

"In 1878, that number amounted to 537,107.

"The difference in favor of 1878 is therefore 249,759 admissions.

"Up to the 4th of September inclusive, the total admissions to the Exposition of 1867, extending back as far as the 1st of December, 1866, had produced 6,492,592 francs 95 centimes.

"Up to the same period the total admissions to the Exposition of 1878, which was opened only on the 1st of May, are represented by the imposing sum of 7,412,219 francs 70 centimes, making a difference of 929,626 francs 75 centimes, or nearly 1,000,000 francs in favor of the Exposition of 1878. The daily average of the receipts for the week ended Sept. 4, 1878, was 76,720 francs 57 centimes. The daily average of the receipts since the opening was 58,363 francs 95 centimes."

To comparisons like the above the anti-Republican journals reply that the amount expended on the Exposition of 1867 was less than 23,000,000 francs, while for that of 1878 the expenditures are already more than 49,000,000, and not yet over. Thus one of them remarks: "In 1867, by the 4th of September, the receipts had covered more than one-fourth of the expenditures, while this year, at the same time, they had scarcely reached one-seventh of the cost." And about a column and a half on this text. The *Figaro*, anti-Republican, ventures a criticism, with which most of the exhibitors will agree, of the postponement of the announcement of awards, and closes its article with its explanation of the large proportion of awards given to some foreign countries:

"M. Krantz is master at the Exposition, notwithstanding what an anonymous correspondent writes me. So true is it that M. Krantz is master that he defied the ministry of the 16th of May. Like a captain on board his vessel, he is master at the Exposition after God. Ask M. Teisserenc de Bort, whom he causes to tremble even in the morocco of his portfolio. Ask the sub-Krantzes, the group chiefs and class chiefs; they will tell you that they have always done as M. Krantz wanted them to, because he never permitted them to deliberate except on questions where their vote was a necessity. And while we are on the subject let me speak once more about the distribution of awards and its delay. It was M. Krantz who wanted an extraordinary ceremony, a procession and the presence of the chambers; he hoped to drown the fiasco of the opening in the solemnity of the end. The ministry did not want a fete; they still remembered the disorders which followed the 30th of June; but M. Krantz brought in the intervention of the high personages of the Republican party. Then he was irritated by the opposition which he encountered among practical people, and the fete of the distribution of awards became with him a disease, a fever, a rage.

"He wants his fete! He will have it! In vain he has been shown the *Double Liégeois*, which announces doubtful weather for the 21st of October; and the *véritable Mathieu Loesberg*, which predicts a tempest and torrential rains for the same day. M. Krantz answered by showing the *Almanach du bon Républicain*, which promises both sun and cool weather for that solemn occasion.

"I shall have my sun of Austerlitz," says the King of the Trocadero crossing his hands behind his back.

"The list of awards is almost entirely known. M. Krantz cannot refuse a favor to a colleague of the senate; the group have their friends—the class judges have theirs also. All the jewelers, all the goldsmiths, all the machine builders know what they have. Are these not the classmates of the Ecole Centrale, the classmates of the Ecole Polytechnique—and my friend Z—and my friend Y!"

"At the present moment the exhibitors who know nothing are those—who have nothing. Twenty-nine thousand secrets cannot be kept three months when 2000 people know them.

"Everybody is aware that at the Exposition the lion's share has been allotted to the foreigners. We have been generously and exquisitely polite. We have done better than the 'Messieurs les Anglais, tirez les premiers,'* of the guards at Fontenoy. We said to the foreigners: 'Take all you want!' And they took all they could. I have explained how in several classes the foreign

jurors very ably defended their interests, and how our countrymen, modest manufacturers or simple Republicans, had had neither authority enough nor science enough to defend their own constituency.

"These latter have, therefore, in almost all cases been sacrificed!

"We shall console ourselves by thinking that this will establish our reputation as the most polite people on earth, and will at the same time allow us to rival the Scotch for the renown of being the most hospitable of the civilized world."

But criticism of M. Krantz and of the Exposition only stirs up the Republicans, and they reply in articles like the following from the *Evenement*:

"It was said yesterday that M. Krantz had withdrawn his resignation. So much the worse! croaked the Bonapartist papers like disappointed crows. Why 'so much the worse'! Do they know? M. Krantz is not natural; he is a Republican.

"But even though he be a Republican he cannot leave a post as important as that of Commissioner-General without some serious motive.

"The desire to please one's adversaries—even when they are unscrupulous—is not sufficient. What motives, then, are alleged by the —— admirers of the bazaar of 1867? They reproach M. Krantz with being arbitrary.

"Do you not think it singular that this argument should come from the Cæsarean camp?

"That we should complain of despotism can be understood."

"But they! * * *

"How has M. Krantz shown himself so arbitrary that it becomes necessary on the eve of the close of the Exposition to deprive ourselves of his valuable services?"

"Here the enemies of the Commissioner-General are rather embarrassed.

"They formulate vague complaints, but so far they have specified nothing or next to nothing.

"They invent reasons. In truth, they compose violent diatribes, and as the administration does not answer them, they gratuitously assume—or, rather, they let others believe—that the victory is theirs.

"But let men in good faith examine the result obtained.

"That result is splendid.

"If the exhibitors had been better agreed,—if certain old fogies had been less lukewarm—many difficulties would have been overcome.

"But what can be done with enemies always in the way and always seeking without truce or mercy to prevent success.

"The clamors of the enemies of the Republic probably do not move M. Krantz, and we still believe that the Commissioner-General will make some concessions to those of his exhibitors who in good faith bring him serious claims.

"At all events M. Krantz will remain, and outside of a few criticisms of details, all good Frenchmen will give him credit for the way in which he has acquitted himself of his task.

"As for you Bonapartist gentlemen, you will have your trouble for your pains.

"You may say what you like, and do what you will, you cannot prevent the Commissioner-General from having two master qualities, which will cause all his minor errors to be forgotten.

"M. Krantz is a savant.

"M. Krantz is an honest man.

"A savant! Do you understand?

"An honest man! Do you hear?"

FOREIGN EXHIBITS.

RUSSIA.

Although the Russian machine exhibit occupies a tolerably large section of the foreign machine gallery, it does not include a great deal of machinery. About one-third of the section is taken up with the exhibits of three of the Russian technical schools—the Technological Institute of St. Petersburg, the Imperial Technical School of Moscow and the School of Arts and Trades of Tscherepovets. Here we find a large collection of hand tools and models of various portions of machinery. The workshop of the Imperial Technical School has sent a number of engines, steam-pumps and various machine tools. The Bellino-Fenderich Works of Odessa are represented by a portable engine and a small horizontal engine. A 50-horse-power engine with patent valve gear is exhibited by Scholtze, Reppau & Co., of Warsaw. Some sugar machinery is sent by Lillop, Rau & Lowenstein, and Edward Gellone Solzak has the drawings of a horizontal hydraulic press of his invention, with a special apparatus for separating the fiber in the manufacture of best sugar.

The kinopansigraph and the othotachyometer are apparatuses for making graphical records—the former of the speed, stops and maneuvers of a railroad train, and the latter of the degree of smoothness with which a train runs, and consequently of the condition of the track. Joseph and William Grafiauskas, of Moscow, are the patentees. Gustave List, of Moscow, has some pumps and fire engines, and Adolph Troetzer, of Warsaw, also exhibits fire engines. It is needless to add that these are hand, not steam fire engines.

The Russian mineral resources are well represented. In various parts of the section we find lumps of bituminous and anthracite coal, principally from the mines of Southern Russia. Besides two lumps of anthracite coal (about 5 feet cube) exhibited by the Dombrowska coal mines, there is a model, on a scale of one-tenth, showing the disposition of the galleries and the method of working these mines. The Russian ores are found in cases along the wall separating the machine gallery from the main hall, and in a portion of the main hall are to be found the ores of Poland, Ural and Russian Turkestan. These collections are quite complete. The iron ores consist chiefly of red and brown hematite and specular ore. Besides these we notice considerable lead, manganese and copper ores.

* Will the English please fire first.

P. Goujon and N. J. Koltchine make large displays of wrought nails, and N. & M. Boutine, of Natchinsk, Siberia, exhibit stove castings and hollow-ware. The Nijen-Taguits Works have a large assortment of iron and steel bars and plate, samples of which are shown, subjected to both hot and cold tests. They have also a number of Bessemer steel, open-hearth steel and puddled rails. In the wide passage which separates the Russian from the Austrian section we find a monumental exhibit of wrought-iron pipe made by Geo. Chavoir, of St. Petersburg, and a display of Siberian graphite, from the celebrated Alibert Mines of Bata-goul. A small portion of the Russian Machine Gallery is devoted to Finnish exhibits. The only machinery we find here is some sent by W. Crichton & Co., of Abo. He has a steam pump, a 5-horse-power engine with boiler, and a steam winch.

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which are shown, subjected to both hot and cold tests. They have also a number of Bessemer steel, open-hearth steel and puddled rails. In the wide passage which separates the Russian from the Austrian section we find a monumental exhibit of wrought-iron pipe made by Geo. Chavoir, of St. Petersburg, and a display of Siberian graphite, from the celebrated Alibert Mines of Bata-goul. A small portion of the Russian Machine Gallery is devoted to Finnish exhibits. The only machinery we find here is some sent by W. Crichton & Co., of Abo. He has a steam pump, a 5-horse-power engine with boiler, and a steam winch.

HOLLAND AND THE DUTCH COLONIES.

A very interesting feature of the Dutch exhibit is a large number of models, maps, and plans of the principal canals, breakwaters and dikes, which have enabled this energetic little people, not only to successfully repel the encroachments of their terrible enemy, the sea, ever ready to swallow them up at the first sign of weakness on their part, but even to tame the monster and turn him from a dreadful into a useful power. The dikes exhibited are founded on timbers and piles filled with stones and riveted with gabions of rushes, willows, &c. Dutch shipbuilding is extensively represented by well-executed models of ships, showing that the once powerful Queen of the Seas has not entirely forgotten the art which Peter the Great tried to learn from her. Most of these models represent fishing vessels and merchantmen.

The machine works and shipbuilding yards of the Dutch Steam Navigation Company, of Fyenoord (Rotterdam) have sent the complete drawings of a high-pressure marine engine of 2700 indicated horse power. This engine was designed for a frigate of the Royal Dutch Navy. The drawings representing cross-sections of the hull are on a scale of 1-5, and that in which the transverse section is shown is on a scale of 1-25. We give below the principal dimensions of the engine and boilers:

ENGINE.

Diameter of piston..... m. 1.85

Travel of piston..... m. 0.60

Number of revolutions per minute..... 90

Variable cut-off, from 1-10 to 5-10 strokes

Diameter of air pump..... m. 0.445

Two condensers with..... tubes 8796

Travel of air pump piston..... m. 0.60

Internal diameter of tubes..... mm. 13

Length of tubes..... m. 2.6

Condensing surface..... sq. m. 725

Diameter of screw..... m. 4.88

Pitch of screw..... m. 5.79

BOILERS.

Number of boilers..... 4

Diameter of boilers..... m. 5.68

Length of boilers..... 5.4

Number of furnaces..... 24

Diameter of hearth..... m. 0.014

Grate surface..... sq. m. 1.823

Number of tubes..... 4720

External diameter of tubes..... 70.6

Length of tubes..... m. 2.045

Heating surface..... sq. m. 1,020

Steam pressure..... atmospheres 4/3

The Royal Machine Works of Amsterdam have an apparatus for the concentration of cane juice, with three boilers and horizontal engine, and a large model (scale, 1-20) of an iron floating dock 100 meters long, 27 meters wide and 12.50 meters deep. The total displacement of this dock when loaded is 8532 cubic meters; the unloaded displacement is 3185 cubic meters, and the unloaded draft is 1.52 meters. A small rotary engine is exhibited by W. H. Jacobs, of Haarlem, and H. J. Koopman displays some injectors. Stork Bros. & Co., of Hengelo, have sent four steam engines—one 20-horse-power engine with patent valve gear and variable cut-off depending on the action of the governor, one small horizontal engine, one semi-portable engine with vertical boiler entirely separated from the engine, both being fixed to a bed plate, and one portable engine. These are representatives of the four types of engines manufactured by this company. They also manufacture wood-working machinery, boilers, hydraulic presses, &c., but they have not exhibited any of these.

"Necessity is the mother of invention," says the wisdom of nations. We have seen above how necessity has developed that branch of civil engineering in Holland which consists in fighting water. When we saw what primitive methods of fighting fire are employed in the Low Countries, ay, and throughout the whole Continent for that matter, our first impulse was to smile. But on second thoughts it occurred to us that if in the United States we have perfected the cure of the evil, they in Europe have found the prevention. Their buildings are almost fireproof. They have no need of a perfect system for mastering fires. They really do not know what a fire is. The ounce of prevention enabled Paris, with no adequate resources against fire, to go through a long siege and the commune with comparatively very little loss by fire; indeed in many cases it was found necessary to cover the buildings with petroleum before they would burn.

What has our pound of cure availed in the great Boston and Chicago fires?

To return to our subject, we find two exhibits of fire engines in the Dutch machine gallery.

A. H. van Bergen, of Heiligere, has one and

A. B. Bikker & Son, of Rotterdam, the other.

The latter claim that with their engine 12 firemen can pump 215 liters of water per minute to a height of 30 meters, through a hose 16 meters long, with a nozzle 14 mm. in diameter.

In the exhibit made by the Dutch East

Indies we find models of mines, samples of

natural and artificial coal, iron and tin ores,

tools and models of apparatus employed in

searching for and in cutting diamonds.

Datoe Candoek Liang So, sub-chief of the

district of Tjandoeeng (Padang), exhibits two

models of water wheels for raising water.

A model of the suspension bridge over the

Batang-Toro is exhibited. It is constructed

on telegraph wire stretched across the river.

Another suspension bridge, that over the

Progo River at Magelang, is constructed

entirely of bamboo. Specimens of the agricultural instruments employed in Java, Sumatra and some of the other islands comprising the Dutch East Indies are also shown. A pyramid composed of 400 ingots of tin

represents the mean daily production for the

**B. KREISCHER & SONS,
FIRE BRICK
AND
CLAY RETORT WORKS.**

Established 1845.

Office, foot of Houston Street, East River,
NEW YORK.The largest stock of Fire Brick of all shapes and
sizes on hand and made to order at short notice.Cupola Brick, for McKenzie Patent,
and others. Fire Mortar, Ground Brick, Clay and
Sand, Superior Kaolin for Rolling Mills and foundries.
Stone Ware and other Fire Clay and Sand,
from my own mines at New Jersey and Staten
Island, by the cargo or otherwise.**NEWTON & CO.,**

Successor to

**PALMER, NEWTON & CO.,
ALBANY, N. Y., Manufacturers of****FIRE BRICK****Stove Linings,**

Range and Heater Linings

Cylinder Brick, &c., &c.

M. D. Valentine & Bro

Manufacturers of

**FIRE BRICK
And Furnace Blocks**

DRAIN PIPE & LAND TILE.

Woodbridge, - - - N. J.

A. HALL & SONS, Perth Amboy, N. J.

ESTABLISHED 1845.

HALL & SONS, Buffalo, N. Y.

ESTABLISHED 1866.

FIRE BRICKof reliable quality for all purposes, manufactured
of the best New Jersey Fire Clays. Also, Architectura
Terra Cotta, Fire Clay, Fire Sand, Kaolin, Ground Fire
Brick and Diamantine Building Brick.**Brooklyn Clay Retort**

AND

FIRE BRICK WORKS.Manufacturers of Clay Retorts, Fire Bricks, Ga
House and other Fire Clay, Fire Sand, Clay Banks
Burt's Creek, New Jersey. Manufacture: Van Dyke,
Richards and Partition Sta., Brooklyn, N. Y.
Office No. 28 Van Dyke St.**Watson Fire Brick Manufactory**

ESTABLISHED 1856.

JOHN R. WATSON, Perth Amboy, New Jersey
Manufacturer of**FIRE BRICK,**For Rolling Mills, Blast Furnaces, Foundries,
Gas Works, Lime Kilns, Tanneries, Boiler
and Grate Setting, Glass Works, &c.
Fire Clays, Fire Sand and Kaolin for Sale**HENRY MAURER,**

Proprietor of the

**Excelsior Fire Brick & Clay
Retort Works,**Manufacturer of FIRE BRICK, HOLLOW
BRICK AND CLAY RETORTS.WORKS: 1 PERTH AMBOY, NEW JERSEY
Office & Depot: 418 to 422 East 23d St., N. Y.**TROY FIRE BRICK WORKS**

Troy, N. Y.

JAMES OSTRANDER & SON,

ESTABLISHED 1845.

Manufacturers of
FIRE BRICK,
Tuyeres, Tiles, Blast Furnace Blocks, etc. Miners and
Dealers in Woodbridge Fire Clay and Sand, and Staten
Island Kaolin.

Established 1864.

GARDNER BROTHERS,

MANUFACTURERS OF

**STANDARD SAVAGE
Fire Brick, Tile & Furnace Blocks,
OF ALL SHAPES AND SIZES.**

Clay Gas Retorts and Retort Settings,

AND

Miners and Shippers of Fire Clay.

OFFICE: 375 Penn Ave., Pittsburgh, Pa.

WORKS: Mt. Savage Junction, Md., and Lockport, Pa.

BORGNER & O'BRIEN,

Manufacturers of

Fire Bricks,
Clay Gas Retorts,

Retort Settings,

Tiles, Blocks, &c., &c.

23d St., below Vine,

PHILADELPHIA.

Eighteen years' practical experience.

CYRUS BORGNER. WM. J. O'BRIEN

John Carver,

MANUFACTURER OF

CAULKING IRONS,

Cotton, Freight and Hay Hooks,

No. 288 Monroe Street,

Bet. Jackson & Corlears Sta., NEW YORK.

95 Chambers St. Read St. 77.

E. S. DODGE

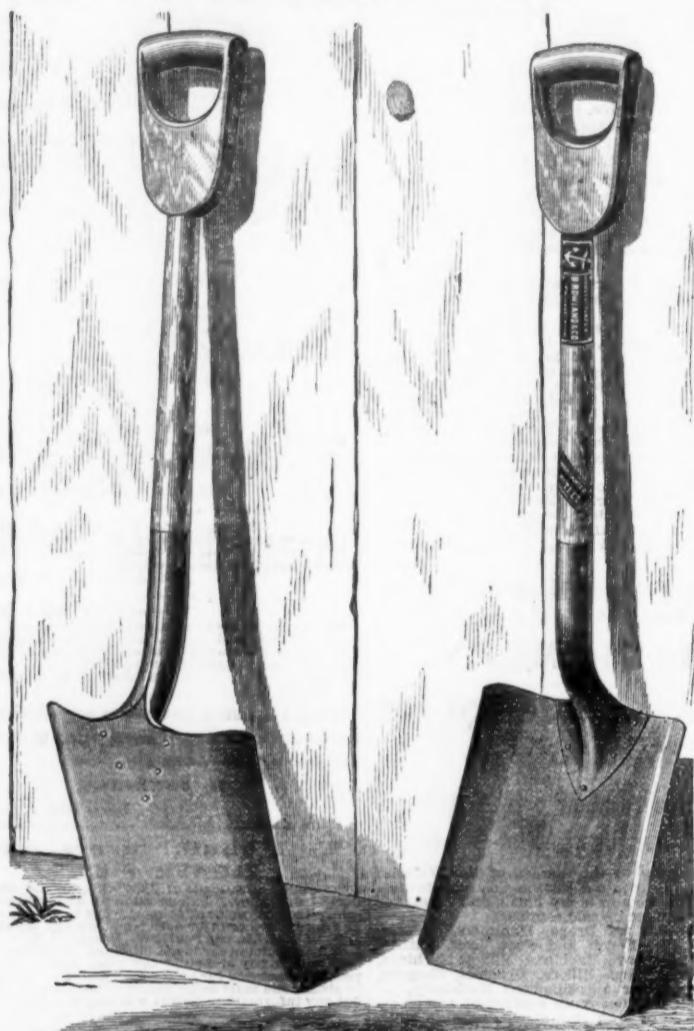
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ED. HUTCHINGS, Sup't. NEW YORK.



**B. ROWLAND & CO.,
PHILADELPHIA.**

**B. Rowland & Co.'s Patent Riveted Shovel.****CAST STEEL.**

We would particularly call the attention of the trade to the Patent B. Rowland & Co.'s Anchor Brand Shovel, as now manufactured by us, possessing as it does improvements in construction which render it the most perfect STRAP Shovel made. In it the old style of back strap is entirely dispensed with, and a front strap substituted, riveted and clamped firmly to the blade, clasping the handle in the manner of a ferrule, thus obviating all danger of tearing off strap and making a more beautiful finish front and back. These improvements add to the appearance of the shovel, enhancing its durability at least one-third, and warrant the assertion that all the Shovels we manufacture from this patent will prove the most desirable ever offered the consumer.

The above advantages are also especially noticeable in our Spades and Scoops under the same patent.

B. Rowland & Co.

**CAST STEEL.**

All goods of this brand (which is copyrighted) are warranted in every respect, and we will guarantee that the following named PATENT RIVETED Shovels and Spades will be made from the gauge of Cast Steel specified:

D Handle Square Point Shovel 13 gauge

D " Round 14 "

Long Handle Round Point Shovel 15 "

D Handle Spades 11 "

D " Western Coal Shovel 15 "

D " Anthracite Coal Shovel 14 "

Gauged by Stubbs' Gauge.

fixed upon two and one-half cents as the wages for digging coal, subject to the decision of a miners' convention to be held at Wiley's Grove, near Elizabeth, at an early day. Meantime miners are forbidden to work for less than the price agreed upon. The operators claim that the Southern demand for coal is so light and the prices so low that they cannot afford to pay the price demanded. In this view a suspension of work for a time is probable.

The coal mines at Church Hill, Ohio, are all in successful operation, and are shipping 400 tons of coal per day.

IRON.

The Wheatfield ore banks, in Spring township, Pa., near Fritztown, operated by Messrs. Eckert & Bro., of the Henry Clay furnaces, this city, are at present worked day and night, excepting Saturday and Sunday nights. Two engines are being erected at present at the mines for the purpose of pumping water out of the slopes.

COPPER.

The management of the Osceola mine, Lake Superior, says the *Mining Gazette*, has concluded not to attempt to draw on the "pay ore" stretch of conglomerate to supply the stamp mill until the lately burned down rock and shaft houses are rebuilt. The work of pumping out the No. 3, or so-called southern shaft, preparatory to sinking it several "lifts," has already commenced. Developments on the amygdaloid, by means of shaft and level, continue. Spots in the lode that have been broken into show some excellent copper ground, and tend to encourage lively hopes for the future of this part of the mining property.

During the week ending April 6, 67,187 pounds of pig copper was received at Silver City, New Mexico, mostly from Arizona.

PRECIOUS METALS.

The silver mines of Georgetown are turning out large quantities of the richest ores. The correspondent of the *Silver City Herald* at that place writes: Messrs. Bettler & Kennedy have a breast 10 feet wide by 3 feet high of splendid ore. They have out about a dozen tons of good ore ready for the mill, and will soon have out as many more. The McNulty mine has been turning out some magnificent ore during the past few days. Stevens & Walters have been taking out some better ore than ever, which will exceed \$2000 per ton.

Speculative Building.

From a paper read before the Public Health Association of New York by Mr. Charles F. Wingate, we take the following, which will command itself to all plumbers: Sewer gas is not a new thing. Years ago it was analyzed, and its constituents and action are fully detailed in medical and sanitary publications. But why it should suddenly develop as it has lately done, with its attendant train of disease, and why it should most affect the houses of the well-to-do rather than those of the very poor, is a problem not yet explained.

It is well known that foul air and defective drainage create disease in the slums of all great cities. The so-called modern improvements, so conducive to cleanliness and therefore, it would seem, to health, have apparently been the means of introducing malaria into our houses. Hence has arisen a widespread and growing distrust of such improvements, and the opinion is constantly expressed that it would be safer to dispense with plumbing altogether and return to the primitive simplicity of our forefathers in such matters. Because railway trains telescope and boilers explode, no one proposes to abolish steam, nor to cease eating because some foods are adulterated. The wholesale denunciations of our present system of drainage is no less unwarrantable and illogical.

Where, then, does the blame rest? Plumbers, like mothers-in-law, have received more than their fair share of ridicule and odium, and it is time justice should be done them. The real culprit who is primarily responsible for the presence of sewer gas in so many modern dwellings is the "speculative" — or, as he is called in England, the "Jerry" — builder. By the term "speculative builders" is not meant capitalists who build houses on speculation, and who, having a reputation to sustain, build durably and well. The former class are wholly irresponsible. Lacking technical training, and having little (if any) education, their knowledge is confined to a mastery of the methods of how to humbug the public. They are not bad-looking houses as a rule, but, being built to attract the eye, the greatest attention is paid to appearances. Usually they are mere shells, hastily run up, and of cheap, unseasoned materials. The walls soon sink and crack. The plaster flakes off; the woodwork warps, doors sag, sashes stick, roofs leak, chimneys choke, and general deterioration follows. Within a year repairs are necessary, and once begun they soon become chronic. Yet no amount of outlay will result in more than a mere patch-work, and the whole structure may be summed up in the apt trade phrase, "cheap and diphtheria." The building and fire department regulations are skillfully evaded, while as we have not yet reached the point of enforcing a proper standard of workmanship and material in plumbing, the latter is neglected in the most criminal manner. Soil pipes will be left without any sewer connection, or they may be fairly honeycombed with holes from flaws in casting; lightweight traps will be used; joints made with putty instead of lead or cement, and proper ventilation and traps will be conspicuously lacking. Yet such of the plumbing fixtures as are not hidden beneath floors and in dark corners may be handsome, if not elegant, with marble-topped basins, silver-plated faucets, and other luxuries calculated to give the impression that everything is solid and complete.

The number of such dwellings in New York and its vicinity must be reckoned by thousands. The entire upper part of Manhattan Island above Thirty-fourth street is packed with the work of the speculative builder. In Boston, a late examination by the Board of Health of the sanitary condition of 345 specimen houses in all parts of the city showed that 198 had defective drains, 205 had soil pipes without ventilation, 110 had

damp or wet cellars and 275 were without effective traps. In Brooklyn, out of 37 houses in which contagious diseases occurred a short time since, 33 had defective plumbing. Indeed, it is safe to say that two-thirds of the new dwellings in all our leading cities have been built "on speculation."

A builder contracts with a capitalist to purchase through the latter one or more city lots at a fixed profit of from 25 to 100 per cent., on which he agrees to build provided the capitalist advances one-half the cost of the improvement as a loan. The lot value, profit and loan, are all secured by mortgage. The builder immediately "conveys" a goodly portion of the loan to his private use, and supplies the deficiency by issuing notes. He contracts with masons and other mechanics to supply materials and begin the work of building. As the original loan is sufficient to pay the cost of construction, these sub-contractors feel secure of pay, and eagerly bid for the work. First payments and some wages are needed to start the enterprise, but soon the set purpose of the builder is evident — to pay out as little money as possible. Notes are substituted for cash, and are renewed and extended indefinitely. The sub-contractors being obliged to complete their work before they are entitled to the benefit of the lien law, gives the builder almost despotic control over them. They are fortunate if the buildings are completed at all. Often a deadlock ensues, and the capitalist is induced to discount future payments by plausible pleas or fat bonus. If the building is finished it is placed on the market, and by dexterous management sold "on easy terms." In that case the builder is in pocket and begins a new speculation of the same kind. But if the building fails to meet with a ready sale, the capitalist forecloses the mortgage in default of interest payments, or for some other cause, and appropriates the property himself. This leaves the builder with a fair stock of money from the unexpired portion of the loan, while the sub-contractors and mechanics are compelled to whittle for their dues, having been cut out of their liens by the priority of the capitalist's claim.

But the palmy days of the speculative builder are past. Savings banks and trust companies no longer proffer him loans. His credit, like his occupation, is gone. Meantime the public is becoming alive to the need of greater care in selecting dwellings, and is less disposed to take things for granted in sanitary matters. What is still wanting, though vitally necessary, is a system of competent inspection of dwelling houses, and the enforcement of requirements for the protection of health similar to those for security against fire and accidents. When this is accomplished a new era will have dawned, and a very sensible check will be imposed upon the mortality of the metropolis.

Relief for the South.

12 Chambers Street, New York, September 25, 1878. To the Editor of *The Iron Age*: The following is copy of letter received from the Howard Association, New Orleans, La., acknowledging \$75 from the operatives of the Northampton Cutlery Co. Notice of this in your columns may induce operatives of other factories to respond to the call for aid to the suffering South.

Yours truly, THEODORE WEED.

Office of HOWARD ASSOCIATION, 53 Camp Street, NEW ORLEANS, La., September 16, 1878.

NORTHAMPTON CUTLERY CO.—Gentlemen: Your favor of the 11th inst. has been received and noted. Therein we found draft on New York for (\$75) seventy-five dollars, subscription for the aid of the yellow fever sufferers by the operatives of your Company.

Visits solicited.

Special Notices.

PATENT RIGHTS FOR SALE.

Mannebach Nitre Planing Machine. Also, Mannebach Box Dressing Machine, patented June 29, 1878, calculated to clean 100 boxes per day. Machine may be seen at 15 Essex St., New York.

FOR SALE.—ONE DOUBLE-HEADED LATHE, specially built for turning off the ends of iron columns. Heads are double geared, one head shifting. Swings 3 ft.; shears measure 30 ft. long by 4 in. wide. In prime order, and is a first-class tool. Lately used in Jackson's Associate Works, Price \$1000. One single head LATHE Works with a round leather belt. Swings 4 ft.; total length, 30 ft. Out of the Allaire Works. In good order. Price, \$500.

ONE SPINNING DRILLERS, with drill tables and all complete. Price, \$20 each.

One No. 1 Sturtevant Blower for forces. New. Complete. Two of the eight arms accidentally broken, but does not affect working. Price, \$200.

ONE SPINNING DRILLERS, with drill

tables and all complete. Price, \$20 each.

One pattern-makers' Jig Saw, iron frame table. Price, \$12.

W. M. F. FRYER, JR.,
Etna Iron Works, 104 Goerck St., N. Y.

SEPTEMBER LIST, No. 2.

MACHINE TOOLS,
Second-Hand.

Two Woodruff Steam Engines, automatic cut-off, cylinder, 30 inch diameter, 48 inch stroke. One Portable Engine, 7 in. cylinder. One No. 3 Stiles Geared Press. One No. 2 Fowler Press. One Sellers 50 lb. Steam Hammer. One Hand Milling Machine. One "Fond" Index Milling Machine. Three Chase Patent Pipe Cutting Machines. One Engine Lathe, 16 in. swing, 8 ft. bed. One Back Geared and Self-Feed Drill, 32 in. swing.

One Pattern Makers' Lathe, 22 in. swing, 8 ft. bed, iron shears overhanging face plate and tripod rest.

Two Engine Lathes, 13 in. swing, 6 ft. bed.

Two Engine Lathes, 22 in. swing, 8 ft. bed.

One Engine Lathe, 7 in. swing, 6 ft. bed.

One Engine Lathe, 10 in. swing, 6 ft. bed.

One Engine Lathe, 15 in. swing, 7 ft. bed. Three Engine Lathes, 20 in. swing, 8 ft. bed. Six Turning Lathes, 14 in. swing, 4½ ft. bed. Three 4-spindle Drills. One 32x32 ft. Planer. One 48x48x12 ft. Planer. One 8 in. Shaper. One Gear Cutter. One new "Hardaway" Bolt Heading Machine, to head up to 12 in. bed. One new "Hardaway" Bolt Heading Machine, to head up to 14 in. bed. One new "Hardaway" Bolt Heading Machine, to head up to 16 in. bed. A lot of Saw Tables and Wood Working Machinery.

Please specify which of the above tools you want and we will forward all particulars.

The above tools will be sold very low, and can be seen at

The George Place Machinery Agency,
121 Chambers and 103 Reade Sts., N. Y.

MACHINERY.

Machine & Forging Shop Equipment
FOR SALE.

All the Machinery & Tools, Patterns & Drawings, Merchandise, &c., &c.,

belonging to the estates of the *Hull & Belden Co.*, Bartram & Fenton Co., and Stevens, Holley & Co., are now in my hands and for sale at low prices to close up said estates.

Same consists of Drop Hammers, Presses, Forging, Boring, Drill, and Vise Machines, Planers, Drills, Screw Machines, Milling Machines, Gear Cutters, Hand Millers, Grinders, Sharers, Edgers, and other miscellaneous Machinery, together with full tool room equipment and an assorted stock of iron and steel, desirable sizes, shapes and qualities. Will be sold all together or separately. The established business of the *Hull & Belden Co.*, good &c., will be turned over into the hands of the *new* partners, who will purchase enough of the outfit to carry on said business and keep same in Danbury. Said business can be shown to be a paying one if intelligently managed.

Visits solicited.

F. A. HULL, Danbury, Conn.

For Sale or to Rent!

RARE OPPORTUNITY!!

Richmond Architectural Iron Works, established for more than 20 years, embracing a centrally located lot of 120 feet front on Cary street, running back on the line of Eleventh street 150 feet to an alley 20 feet wide. The improvements consist of a main shop, built of brick and covered with slate, 60x50 feet, 3 ft. 6 in. stonewall, exclusive of cellar and attic. A brick foundry 30x60 feet, and brick offices and pattern shop, 30x60 feet.

In the foundry are two large cranes, No. 5 McKenzie Cupola and Sturtevant blower.

The machine shop embraces a complete outfit of valuable tools, as Machine Lathes, Drill Presses, Iron Planer, Gear Cutter, Emery Machines, &c.

A set of patterns of great variety, embracing almost every order of machine work.

For every thing necessary to "start up" the works at once for a business of \$200,000 per annum.

The property will be sold at a great sacrifice from the original cost.

Purchaser can divide the machinery, patterns, &c., from the real estate if he does not care to buy the whole, or offer a lease of the whole property; or for the machine patterns, &c., with such portions of the real estate as may be needed for the conduct of the business will be entertained.

Apply in person or by letter to

Wm. L. Cowardin, Pres't,

No. 1015 Main St.,

Richmond, Va.

Wanted,

A responsible firm to take the Eastern Agency of our Anti-Friction Door Hangers.

Trade well established in the West.

Address

CLEVELAND HARDWARE CO.,

Cleveland, Ohio.

BISELL & WELLES,
Auctioneers.

Special and Preemptory Sale of 100 kegs Flat and Round Head Rivets, assorted lengths and sizes, on Tuesday, Oct. 8th, at 10 a.m., at our saleroom, No. 42 Chambers and 56 Reade Sts., New York. The goods sold at the sale will be at the order and good sizes, and assorted Flat and Round Head, Bevel, Cone, Countersunk and Steeple Head Shovel and Head Rivets, Coach Screws, &c. The entire quantity will be sold without reserve and in quantities to suit the small and large trade.

Best reference given.

Address

HARDWARE,

Office of *The Iron Age*, 83 Reade St., N. Y.

WANTED—BY AN ENGLISHMAN (age 30)

in a situation as manager or assistant manager of engineering, iron or steel works. Has had good experience both in England and America. First-rate references. Is an Associate of the Institution of Civil Engineers. Address J. J., care of W. H. SMITHSON, Iron Merchant, &c., MIDDLEBROOK-ON-TREES, ENGLAND.

A GENTLEMAN

with 12 years' experience with the New England Iron Works. Trade desired a position with some manufacturing company as a traveling salesman. Trade already established. Address

HARDWARE,

P. O. Box 1051, Boston.

Wanted,

A foreman to take charge of a Malleable Iron Foundry. Must be a man of experience and one who understands thoroughly the business in all its details of manufacturing.

Address, stating past experience and giving reference.

Box 324 Milwaukee, Wis.

Office of *The Iron Age*, 83 Reade St., N. Y.

Scrap for Sale.

About three tons extra selected heavy Norway Iron Scrap—all pure imported Norway.

About one ton common heavy Iron Scrap.

About one-half ton extra Tool and Machinery Steel Scrap.

F. A. HULL, Danbury, Conn.

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ONE DOUBLE-HEADED LATHE, specially built for turning off the ends of iron columns. Heads are double geared, one head shifting. Swings 3 ft.; shears measure 30 ft. long by 4 in. wide. In prime order, and is a first-class tool. Lately used in Jackson's Associate Works, Price \$1000.

ONE single head LATHE Works with a round leather belt. Swings 4 ft.; total length, 30 ft. Out of the Allaire Works. In good order. Price, \$500.

ONE SPINNING DRILLERS, with drill

tables and all complete. Price, \$20 each.

One pattern-makers' Jig Saw, iron frame table. Price, \$12.

W. M. F. FRYER, JR.,
Etna Iron Works, 104 Goerck St., N. Y.

SEPTEMBER LIST, No. 2.

MACHINE TOOLS,
Second-Hand.

Trade Report.

Office of THE IRON AGE,
WEDNESDAY EVENING, Sept. 25, 1878.

The past week has been very dull in the financial markets, nothing of interest having happened except the decline of $\frac{1}{2}$ in Consols in London, reflecting a popular fear that the Eastern question is not yet entirely settled, and that hostilities between England and Russia are possible in the near future. The local money market continues very easy. The rate on call loans is $1\frac{1}{2}$ @ 2%; on prime business paper, 4 @ 5%.

The gold market remains without feature of general interest. All fluctuations during the week have been between $\frac{1}{2}$ and $\frac{1}{4}$ premium.

Government bonds have been firm during the week; State bonds steady; railway mortgages irregular, but generally higher. We give below the closing quotations of governments.

The stock market has been strong and advancing during the past few days. The principal dealings have been in Lake Shore, Northwest, St. Paul, and D. L. & W. All the coal stocks are heavy.

The changes in the averages of the New York banks during the past week are not very large nor important, the net result being a reduction of only \$343,450 in the surplus reserve, which now stands at \$12,535,200. The following are the figures:

Sept. 14. St. t. 21. Differences.
Loans. \$2,015,500 \$245,377,000 Inc. \$1,165,300
Specie. 18,524,700 18,524,700 Dec. 21,000
Legal t'd'n. 48,820,200 48,538,400 Dec. 31,800
Deposits. 218,260,500 217,304,000 Dec. 96,500
Circulation. 19,478,300 19,016,300 Inc. 138,000

The foreign trade movements for the week are shown in the following tables:

IMPORTS.

For week ended Sept. 21:

1876. 1877. 1878.
Total for week. \$6,365,551 \$6,400,133 \$6,652,028
Prev. reported. 209,005,477 237,801,924 203,431,470

Since Jan. 1. \$215,377,008 \$244,306,057 \$209,063,498

Included in the imports of general merchandise were articles valued as follows:

	Quantity.	Value.
Anvils.	187	\$1,708
Bronze goods.	33	5,385
Chains and wire.	35	6,700
Copper.	4	254
Cutlery.	54	55
Gas fixtures.	2	15,499
Guns.	69	12,163
Hardware.	76	71
Iron, pig, tons.	200	3,023
Iron, rods, tons.	1,117	1,206
Iron, other, tons.	317	3,206
Lead, pigs.	535	2,514
Metal goods.	137	17,357
Nails.	1	109
Needles.	8	2,670
Old metal.	4,365	169
Plated ware.	3	405
Pot caps.	58	4,055
Saddlery.	3	1,104
Steel.	1,394	13,511
Spelter.	22,046	8,822
Silverware.	8	1,811
Tin, bxs.	8,546	39,411
Tin, 1000 slabs.	337,011	19,234
Wire.	10	3,042

EXPORTS, EXCLUSIVE OF SPECIE.

For week ended Sept. 24:

1876. 1877. 1878.
For the week. \$5,550,475 \$7,427,911 \$7,543,295
Prev. reported. 186,859,708 193,344,500 246,836,294

Since Jan. 1. \$192,410,183 \$202,772,411 \$254,379,589

EXPORTS OF SPECIE.

For week ended Sept. 21:

\$25,000.
Previously reported. 10,410,663

Total since Jan. 1, 1878. \$10,444,663
Same time in 1877. 32,653,357
Same time in 1876. 40,448,000
Same time in 1875. 64,873,174
Same time in 1874. 44,404,043
Same time in 1873. 41,387,331
Same time in 1872. 57,558,178

Government bonds were firm throughout, closing at the following quotations:

Bid.	Asked.
U. S. Currency 6's.	119 $\frac{1}{2}$ 119 $\frac{1}{2}$
U. S. 6's 1871 registered.	107 $\frac{1}{2}$ 108
U. S. 6's 1861 registered.	107 $\frac{1}{2}$ 108
U. S. 6's 1861 cou.	109 $\frac{1}{2}$ 109
U. S. 6's 1867 reg.	105 $\frac{1}{2}$ 105 $\frac{1}{2}$
U. S. 6's 1867 cou.	105 $\frac{1}{2}$ 105 $\frac{1}{2}$
U. S. 6's 1868 reg.	107 $\frac{1}{2}$ 107 $\frac{1}{2}$
U. S. 6's 1868 cou.	107 $\frac{1}{2}$ 107 $\frac{1}{2}$
U. S. 10-40 reg.	106 $\frac{1}{2}$ 106 $\frac{1}{2}$
U. S. 10-40 coupon.	106 $\frac{1}{2}$ 106 $\frac{1}{2}$
U. S. 10-40 registered.	106 $\frac{1}{2}$ 106 $\frac{1}{2}$
U. S. 10-40 registered.	106 $\frac{1}{2}$ 106 $\frac{1}{2}$
U. S. 4 $\frac{1}{2}$'s 1861 registered.	103 $\frac{1}{2}$ 103 $\frac{1}{2}$
U. S. 4 $\frac{1}{2}$'s 1861 registered.	103 $\frac{1}{2}$ 103 $\frac{1}{2}$
U. S. 4 $\frac{1}{2}$'s 1867 registered.	99 $\frac{1}{2}$ 99 $\frac{1}{2}$
U. S. 4 $\frac{1}{2}$'s 1867 coupon	100 $\frac{1}{2}$ 100 $\frac{1}{2}$

The following were the closing quotations of active shares:

Bid.	Asked.
Atlantic and Pacific Telegraph.	25 $\frac{1}{2}$ 28
Chicago and Northwest.	35 $\frac{1}{2}$ 35 $\frac{1}{2}$
Chicago, Rock Island and Pacific.	11 $\frac{1}{2}$ 11 $\frac{1}{2}$
Chicago, Bur. and Quincy.	11 $\frac{1}{2}$ 11 $\frac{1}{2}$
Clev. Col., Cin. and Ind.	32 $\frac{1}{2}$ 32 $\frac{1}{2}$
Cleveland and Pittsburgh.	8 $\frac{1}{2}$ 8 $\frac{1}{2}$
Chicago and Atlantic.	8 $\frac{1}{2}$ 8 $\frac{1}{2}$
Canton.	10 $\frac{1}{2}$ 10 $\frac{1}{2}$
Delaware, Lack. and Western.	17 $\frac{1}{2}$ 20
Delaware and Hudson Canal.	49 50 $\frac{1}{2}$
Express—Adams.	105 105 $\frac{1}{2}$
" American	49 $\frac{1}{2}$ 50
" United States	49 $\frac{1}{2}$ 50
" Wells, Fargo & Co.	94 $\frac{1}{2}$ 95 $\frac{1}{2}$
Erie.	13 $\frac{1}{2}$ 13 $\frac{1}{2}$
Hartford.	13 $\frac{1}{2}$ 13 $\frac{1}{2}$
Hannibal and St. Joseph.	13 $\frac{1}{2}$ 13 $\frac{1}{2}$
" Pref.	38 38 $\frac{1}{2}$
Illinois Central.	81 $\frac{1}{2}$ 81 $\frac{1}{2}$
Kansas and Texas.	3 $\frac{1}{2}$ 3 $\frac{1}{2}$
Lake Shore.	67 67 $\frac{1}{2}$
Michigan Central.	70 $\frac{1}{2}$ 70 $\frac{1}{2}$
Morris and Essex.	30 $\frac{1}{2}$ 30 $\frac{1}{2}$
Milwaukee and St. Paul.	30 $\frac{1}{2}$ 30 $\frac{1}{2}$
" Pref.	70 $\frac{1}{2}$ 70 $\frac{1}{2}$
New York Central.	113 $\frac{1}{2}$ 123 $\frac{1}{2}$
New Jersey Central.	35 $\frac{1}{2}$ 35 $\frac{1}{2}$
New Jersey Southern.	1 $\frac{1}{2}$ 1 $\frac{1}{2}$
Ohio and Mississippi.	7 $\frac{1}{2}$ 7 $\frac{1}{2}$
Pacific Mail.	17 $\frac{1}{2}$ 17 $\frac{1}{2}$
Penn.	28 $\frac{1}{2}$ 28 $\frac{1}{2}$
Pittsburgh and Fort Wayne.	97 $\frac{1}{2}$ 98 $\frac{1}{2}$
Quicksilver.	13 13
" Pref.	31 $\frac{1}{2}$ 34
St. Louis Kansas City Northern.	4 $\frac{1}{2}$ 21 $\frac{1}{2}$
" Pref.	20 $\frac{1}{2}$ 21 $\frac{1}{2}$
Toledo, Wabash & Western.	18 $\frac{1}{2}$ 18 $\frac{1}{2}$
Union Pacific.	66 $\frac{1}{2}$ 66 $\frac{1}{2}$
Western Union Telegraph.	95 $\frac{1}{2}$ 95 $\frac{1}{2}$

GENERAL HARDWARE.

The condition of the market is much the same as at our last writing. Business continues active, and prices are, as a rule, firm. No changes in values have transpired during the week.

The demand for Nails is firm at unchanged prices. We continue to quote 10d. to 6d., \$2.15 @ \$2.20, net, according to quantity.

Clark & Co., Buffalo, N. Y., have issued a circular under date of the 20th inst., in which they quote their No. 1, 3 and 5 Improved Patent Blind Hinges at the following list, which is subject to discount 6s and 10s per cent:

Clark's Improved Blind Hinge Price List.

No. 1, for wood thrown the Blind $\frac{1}{4}$ inches. Per doz. sets, 1, from the casing. \$3.50

3, for brick, throws the Blind $\frac{3}{4}$ inches from the casing. 5.25

5, for brick, throws the Blind $\frac{1}{2}$ inches from the casing. 10.00

We have received the following circular:

NOTICE TO THE TRADE.

BUFFALO, N. Y., Sept. 23, 1878.

Understanding that, owing to the popularity and large sale of our "Noiseless Blind Hinge, No. 50" patented March 19, 1878, Clark & Co., of this city, have put in market an entirely different article, in imitation; and having pirated both the name and trade name of our Hinge, and endeavoring to sell their Hinge, representing it as "Noiseless Blind Hinge, No. 50," we deem it proper to notify the trade that we are the sole manufacturers of Shepard's "Noiseless" Blind Hinges, and that the patent is owned exclusively by us.

Parties ordering should not be deceived by the imitation Hinge offered by Clark & Co., under the name and trade number used by us, and should order only the genuine Shepard's "Noiseless" Blind Hinge; which, it is perhaps needless to say, has the well-known reputation of being the only Blind Hinge that positively prevents rattling of Blinds.

Shepard Hardware Co.

The Southwark Hardware Co., of Philadelphia, have placed on the market a Toy Scale, which is illustrated in their advertisement on page 24, and to which we invite attention. It is a neat little article and is intended to combine pleasure and instruction. Charcoal Tins and Ternes are far from strong, though not quite in the demoralized condition of Coke Tins. Coke Ternes are little inclined for, and the make is so limited that prices are nominally maintained. Export to the United States, Jan. 1 to Sept. 1, 69,755 tons, against 70,270 in 1877 and 59,214 in 1876.

Lead.—Holders are more anxious to do business than buyers, and we are told that several lots have been quietly sold below 3 $\frac{1}{2}$ ¢; some 500 tons are thus being spoken of, but we cannot trace this to a reliable source. There were sold in the open market 100 tons at 3 $\frac{1}{2}$ ¢, and at this figure the market is flat at the close. Fine Lead is also dull at 3 $\frac{1}{2}$ ¢ @ 3 $\frac{1}{2}$ ¢. Lead has again declined 2/6 in England, where English Pig was obtainable at £16.2/6; Sheet at £16.5/6; and Spanish Pig at £16. The market for Manufactured is quiet and steady at manufacturers' prices, which are unchanged. We quote Bar, 5¢; Pipe, 5¢; Sheet, 6¢; Tin-lined Pipe, 12¢; No. 1 Solder, 8 $\frac{1}{2}$ ¢, all less 10% to the trade.

Spelter and Zinc.—Common Domestic Spelter is extremely dull here at 4 $\frac{1}{2}$ ¢ @ 5¢. There is no Silesian here to speak of, and there is in consequence a better feeling and more life to the market than we have noticed for some time. The sales reported are 500 tons Poughkeepsie No. 2 at \$14.15 at works, 500 tons Manhattan No. 2 X at \$15.25 at works, and 200 tons No. 1 Lehigh in lots on private terms. We quote as before: Foundry No. 1, \$16.50 @ \$17; Foundry No. 2, \$15.50 @ \$16.50; Gray Forge, \$14.50 @ \$15.50.

Scotch Pig.—The demand for Scotch Iron continues light, and the only sales we hear of are small retail parcels. We hear of the arrival of 300 tons. We quote, in a small way: Glengarnock, \$23.75; Eglington, \$22.75; Col

Sheet Iron.—There is a fairly active demand, and we hear no complaints from the trade, except that prices are entirely too low to permit of a fair living profit. From the amount of Sheet Iron now changing hands it might be supposed that an attempt would be made to advance prices, but there is so much competition that sellers show greater anxiety to retain their trade than to secure higher figures. Buyers find more difficulty in obtaining concessions, however, than they did some time ago, so that the average price realized is no doubt slightly higher than during the summer months, although quotations are nominally the same. We quote: Common Sheet, No. 20 to 23, 2.8¢ @ 2.0¢; No. 24 to 26, 2.9¢ @ 3¢; No. 27 to 28, 3.1¢ @ 3.15¢; Best Refined Sheet Iron, No. 16 to 21, 3¢ @ 3.1¢; No. 22 to 24, 3.1¢ @ 3.2¢; No. 25 to 28, 3.3¢ @ 3.4¢; Best Bloom Sheets, No. 16 to 21, 4.7¢ @ 4.8¢; No. 22 to 24, 5¢; No. 25 to 28, 5¢ @ 5.2¢; Common Red Plates, 5-10 to 18, 2.4¢ @ 2.5¢; Refined Plates or Blue Annealed, 5-10 to 18, 2.4¢ @ 2.6¢; American, R. G., 5-16 to 18, 2.9¢ @ 3.1¢; Best Bloom, 5-10 to 18, 4.9¢ @ 5¢; Philadelphia Russia, 6.5¢; A. Patent Planished, 10 1/2¢; B. Patent Planished, 9 1/2¢; Bloom Galvanized, 4¢; Refined Galvanized, 50%, with extra discounts for large lots.

Bar Iron.—This department of the Iron trade does not improve, as under the circumstances might be expected. Higher prices in the West, higher rates of freight, and an almost total suspension of the mills in Philadelphia, have so far failed to influence prices in the least—that is, so far as an advance is concerned; a decline may have been prevented and concessions made less frequently, but there is no advance and no indications of any. This branch of trade is extremely depressed and the demand of the most meager and unsatisfactory character, and until consumptive requirements increase there is not much room for better prices. We quote 1.6¢ @ 2.0¢, according to quantity and quality.

Steel Rails.—There is no news of special interest; the mills are full of work, with prospects of some large orders being on the market in the course of a few weeks. Not a few small lots have been placed during the week, and a large amount of business might be secured if sellers were in a position to make prompt deliveries. There is no doubt of the fact that buyers are more desirous of placing their orders than manufacturers are to accept them, simply because their engagements are already sufficiently extensive. Prospects indicate a continued active demand in the future, and as there is no reason to anticipate lower prices there is, of course, nothing to be gained by entering orders far in advance. Sales during the past week include a lot of 10,000 tons at Chicago, understood to be at about \$45, and a number of small lots within range of our quotations, viz., \$43 @ \$46, according to section, time of delivery and location of mill.

Iron Rails.—There has been a very active market during the past few days, and some large contracts have been closed, probably 12,000 to 15,000 tons in all. There are inquiries for other lots, and if sellers are willing to accept the collaterals, large orders may be secured at once. Among the sales actually closed we are advised of one of 8000 tons for Western delivery, three of upward of 1000 tons each, besides a number of small lots. Prices are steady and unchanged, viz., \$32 @ \$34.50 at mills, according to quality and section.

Old Rails.—The market is in a somewhat mixed condition, with no lots of any importance changing hands. There are very few spot lots offering, and such have generally commanded from \$10 to \$19.50, with extra qualities held for higher prices. It is difficult to say what prices would be paid for large lots, simply because there are none of offering. Buyers intimate that they can supply their wants at \$18 @ \$19, while sellers claim that \$19.50 could be obtained if they had the article to offer. We have just heard of a sale of 700 tons at \$19.25, which is probably a fair index of the market for average qualities.

Old Car-Wheels.—Are in demand about \$16, but there are none on the market.

Old Car-Axes.—Are also wanted at about \$23 @ \$25, but we cannot hear of any being offered in this market.

Scrap Iron.—The demand continues brisk and good qualities command full prices, say \$13.50 @ \$15 for Cast and \$20 @ \$22.50 for Wrought.

Nails.—There is no change in prices, although stocks are diminishing quite rapidly. The demand is not active, however, and \$2.15 @ \$2.20 may be regarded as the usual price for small lots.

Shot.—The demand has been unusually heavy during the past ten days, but prices remain as last quoted.

PITTSBURGH.

Office of The Iron Age, 77 Fourth Avenue, Pittsburgh, Pa., Sept. 4, 1878.

While general business is not what it should be and usually is at this particular time, it is improving, nevertheless, and the outlook for a legitimate, healthy trade is more encouraging than it has been for several years. Nearly all our manufacturers are now pretty well supplied with orders, and while prices afford a very small margin for profit they are firmer, and there is not the same disposition to cut, which may be attributed to a decreased production and the prospect of an increased consumption. To those who have weathered the storm and come out with an unspotted reputation, who have conducted their business honestly in justice to man and fear of their maker, better times are near at hand; such men or firms will of necessity stand high, and when the reaction sets in will get along much better and smoother, as they should, than those who are suspected of having taken advantage of their creditors. In a word, it will be a good while before those who are known or even suspected of having taken advantage of the bankrupt law, who went into bankruptcy to avoid meeting just obligations, having first put all their property

out of their hands, will receive much countenance in business circles; they will, as they should, be distrusted, and having no credit, will be compelled to do business on a cash basis.

The arrival of the Presidential party yesterday, en route to Washington, created, as might be expected, quite a commotion; to-day a public reception was given and the Exposition taken in. The city, along the route of the procession in particular, is gaily decorated, and there are a great many strangers here. The visit of the Presidential party to the West has done much good, and the common-sense speeches of the President have had a most salutary effect. His statements in regard to the national finances have already done much toward restoring confidence, and will, there is reason to believe, cause a collapse of the greenback movement at the polls this fall. A strong effort is being made in this district to send a greenbacker to Congress, but the greenback party here is losing ground, and there is not much doubt but the present member, the Hon. Russell Errett, will be returned, as he should be. The interests of our manufacturers demand Congressmen who are sound on the tariff and against any inflation of the currency.

Pig Iron.—There has been no material change in the situation since the date of our last report; business is increasing, notwithstanding consumers, as a rule, are buying only to supply immediate actual wants. Standard Red-short Mill Irons (all ore) are more inquired for, and but for the firmness of holders a largely increased volume of business would be transacted; the mills generally have a very light supply, and but for the extreme views of holders, some of whom are virtually out of the market, would buy freely, as they must have some for mixture. Of poor Irons, however, there is no scarcity, and for these the market is no better; prices are no higher, nor are they likely to be soon, although it is not probable that they will be any lower, in view of the fact that current rates afford little or no margin for profit. Some operators are apprehensive that an advance of a dollar or two per ton may start up a number of idle furnaces, and thereby increase production; but in the absence of decided advance we do not think there is much to be apprehended on this score; a number of idle furnaces are in the hands of creditors, and in no event are they likely to blow in for some time to come. Bituminous Coal Smelted Irons—\$18 @ \$19, 4 mos., for Foundry; \$17.50 @ \$18.50 for Forge, some holders refusing to accept anything less than \$19, 4 mos. for (all ore) Red Short. Coke Irons—\$16, cash, to \$16.50 @ \$17, 4 mos., for Forge. Charcoal—No. 1 Foundry, Fine Grove, \$26, 4 mos.; Ohio do., \$25; ordinary brands, \$23 @ \$24; No. 2 do., \$21 @ \$22.50; Cold Blast do., \$30 @ \$35; Eastern Cold Blast, \$28 @ \$30, 4 mos. Bessemer Pig is firm at the advance noted in our last report, and while, so far as your correspondent has been able to learn, there have been no sales above \$20, 4 mos., delivered free on cars here; some furnacemen are holding at \$21.

Manufactured Iron.—The improvement noted in our last two or three reports still continues; the mills have all the orders they want, and the advance of last week is well sustained. At no time since the panic have our manufacturers worked together as harmoniously as at present; there is no cutting of rates, so common until quite recently, and no disposition to cut. Indeed, as stated in our report of last week, our manufacturers, almost without an exception, are refusing contracts for future delivery, and some of them are not disposed to sell largely for immediate delivery, even to regular customers. In a word, the trade are determined to keep themselves in a position so that if an advance takes place they will be able to take advantage of it, and not place themselves at the mercy of jobbers, as has been the case for some years past. We continue to quote on a basis of 1.75-20 days, for Merchant Bars, with the usual discount of 2% per cent for cash.

Nails.—The market presents nothing new or important. There is an increasing demand but no improvement in prices, which are unsatisfactory to makers. The common rate here is \$2, 60 days, 2 per cent. off for cash; at Wheeling, \$1.90, 2 per cent. off for cash. It is stated that the Wheeling factories are refusing to sell except to their regular customers at quoted rates; also that they are using a good many old rails in that vicinity, as well as at other points west of Pittsburgh.

Steel.—The mills are generally reported busy, and prices are firmer but unchanged. Tool Steel, 10 1/2¢ @ 12 1/2¢, according to quality; Machinery Steel, 5¢ @ 7¢; Spring Steel, 6¢ @ 7¢; Boiler Plates, 7¢ @ 8¢. The consumption of American Steel has been steadily on the increase for a number of years past, its cheapness causing it to supplant the imported article, and since its introduction into American markets the strong prejudice which at one time existed in favor of foreign Steel has entirely subsided.

Rails.—Steel Rails are still reported firm at \$44, cash, at mill; Steel Rail Ends, \$28; Steel Blooms, \$40; Steel Billets, \$44, all cash and delivered at mill. Old Iron Rails more inquired for, firm and higher. We can report a sale of 500 tons at \$21, cash, quoted at \$20 @ \$22, cash, according to quality. As stated elsewhere, some of the Nail mills at Wheeling and other points west of Pittsburgh have commenced using them, hence the increased demand.

Wrought-Iron Pipe.—The inquiry continues light for the season, and the prospect is not very bright for the remainder of the year. To those who have weathered the storm and come out with an unspotted reputation, who have conducted their business honestly in justice to man and fear of their maker, better times are near at hand; such men or firms will of necessity stand high, and when the reaction sets in will get along much better and smoother, as they should, than those who are suspected of having taken advantage of their creditors. In a word, it will be a good while before those who are known or even suspected of having taken advantage of the bankrupt law, who went into bankruptcy to avoid meeting just obligations, having first put all their property

out of their hands, will receive much countenance in business circles; they will, as they should, be distrusted, and having no credit, will be compelled to do business on a cash basis.

Window Glass.—There is an increasing demand, but it is not what it should be and usually is at this particular time, and some of the factories have not yet been started up. While the stock in first hands is not large, it is ample for the demand. Discounts are quoted at 75% in a jobbing way and 75% and 10% for car load lots and upward.

Coke.—While business is not active, it is all that can be expected in view of so many Pig Iron furnaces being out of blast. Prices continue low and unremunerative, \$1 per ton at mines and about \$2.15 delivered free on cars at Pittsburgh. The consumption is steadily increasing every year; for many purposes it is taking the place of Coal in consequence of its cheapness.

CHATTANOOGA.

Office of The Iron Age, Market and 8th Sts., CHATTANOOGA, Sept. 21, 1878.

A yellow fever panic here has knocked the bottom utterly out of business. There is a pretty malignant fever here, in small volume, however, and about the nature of which our doctors differ. Since September 1 there have been, as near as can be come at, after discounting all the sensation born of fear and of the disposition of men to romance, 15 cases of whom have died—which the doctors call yellow fever, apparently because they don't know what else to call it. But whatever it is it has completely stopped business in all lines of trade, though there have been no business houses closed and no manufacturers have suspended work. Business men are generally cheerful, being certain the scare—for it is nothing else—cannot last long. The river, from having been too low for boats to run regularly all through August and the first part of September, has suddenly rose to a good boating tide, but the boats will not come here as long as the scare lasts. The railroads are not doing any business worth mentioning; country folks are afraid to come in with provisions, and the market in that line is getting quite bare. The weather during the week has been hot at noon, with cool nights and mornings. The week closes with a cool, drizzling rain, the wind being from the Northwest. We look for and hope for frost soon.

Pig Iron.—Prices at last quotations are stably maintained. The trade with the Southwest is nil; with the Northwest it is dull and light. Orders come in freely from the South Atlantic States, showing considerable activity in that quarter. We quote: Coke Irons, No. 1 Foundry, \$17.50 @ \$18; No. 2, \$15.50 @ \$16; Gray Forge, \$13.50 @ \$14; White and Mottled, \$11.50 @ \$12. Hot-Blast Charcoal—No. 1 Foundry, extra, \$20 @ \$21; do., \$18 @ \$20; No. 2 Foundry, \$16 @ \$18; Gray Forge, \$15 @ \$17; White and Mottled, \$15. Cold Blast Charcoal—Car Wheel Metal, \$22.50 @ \$27.50; do., Extra Standard, \$24.50 @ \$29.50; Forge, \$17.50 @ \$22.

Muck Bar.—\$27 @ \$34. Old Rails, \$17 @ \$17.50. Old Car-wheels, \$18.

Ores.—Brown Hematite, 50 to 56%; P. 50 to 56%; Red Fossiliferous, 50 to 56%; P. ton, \$1.70 @ \$1.90. The above prices for ores delivered in Chattanooga on cars or on the wharf from flat boats.

Nails.—The market is the same as last week. The use of Old Rails by the Wheeling factories has run down the price to a point below which a good article cannot be furnished except at a loss. We shall not be surprised to hear within a couple of months that every mill in the country now turning out strictly standard Nails has shut down. Those Wheeling mills which are now making Nails of honest Nail Plate are offering to put their stocks in Nashville at \$2 rates, cash. We quote at \$2.25 rates, with usual deduction on large lots.

Manufactured Iron.—Trade is fair and the mills are all on double turn and rather gratified at the chance to accumulate some stocks, especially of railroad supplies. Bar we quote at \$2; Railroad Spikes, \$2.50; Light Rail, \$2.25; Track Bolts, \$3; Trestle Bolts, \$4.

Coke.—We quote at \$2.50 per ton on cars in Chattanooga.

Coal.—There promises to be an active market this winter and lower prices for the household article. Competition will be very lively. The Knoxville mines have already entered our market with their popular Grimes and Stove Coals, and the companies in this vicinity are in the field with considerable stocks and large forces of men, most of whom are convicts whom they must feed and guard in any event. The people here are about to realize what they should have had long ago—cheap fuel.

BOSTON.

SEPT. 21.—**Pig** continues extremely dull, and there seems to be an entire lack of confidence among holders. Scotch Pig is quoted here at \$23 @ \$25. The demand continues very light. In Plate Iron the only activity in this market is in Tank, which is selling steadily at 2 1/2¢. Boiler Plate is very dull, quoting 2 1/2¢ for No. 1 Charcoal, 2 1/2¢ for No. 1 Shell, and 3 1/2¢ for Flange. Sales are reported of 10,000 tons Steel Rails, September and October delivery, at \$45, and 10,000 tons for Western delivery at a price which has not transpired. We quote Steel at mill, \$43 @ \$44, and Iron according to quality, terms of payment, &c., \$32 @ \$36. The Ilyrian, from Liverpool, brought 69 cases Steel, order. The Siberia, from Liverpool, brought 61 bds., and 8 cases Steel, H. B. Jackson; 42 bds. coiled End Iron, American Screw Company; 10 cases, 1 cask, 4 bds., and 8 sheets Steel, Wetherell Bros.; 1334 bars Iron, 122 bds. do., Nightingale & Kilton. Copper has been a trifle more active for spots. For manufacturers we quote: New Sheathing at 24¢ @ 26¢. The outside price rules in small transactions, but large buyers are purchasing at the inside figure. Bolts are quoted at 26¢ @ 28¢. Yellow Metal Sheathing continues very weak, quoting 13¢ for English and 13 1/2¢ @ 14¢ for American; Yellow Metal Bolts, 18¢ @ 20¢. Lead continues easy, though there has been fair demand at the declining prices. We quote: Pig, 3 1/2¢ @ 3 3/4¢, currency; Sheet, 6¢; Pipe, 5¢; Tin-Lined Pipe, 12¢; Bar Lead, 4¢; Cold-short, No. 1, 15¢; do., 15¢; Old Rails, prime, cash, 18¢ @ 19.00.

FORGE IRONS.—

Hanging Rock, No. 1 C. C. \$22.00 @ 22.00
C. C. No. 2 19.50 @ 20.50
Alice, No. 1 Extra, I. M. 21.00 @ 21.00
" No. 1 " N. O. 20.50 @ 20.50
Hanging Rock Coke and S. C. No. 1. 17.00 @ 17.00
Virginia Coke, No. 1 17.00 @ 17.00
Shawnee S. C., No. 1 18.00 @ 17.50
" S. C. No. 2 16.00 @ 17.00
Hocking Valley S. C., No. 1 18.00 @ 17.00
" S. C. No. 2 16.00 @ 17.00

CAR WHEEL AND MALLEABLE.

Hanging Rock C. B. 30.00 @ 31.00
Cherokee C. B. 28.00 @ 30.00
Southern and Western Brands. 28.00 @ 30.00

is firm and fairly active, and we quote 12¢ @ 12 1/2¢. Spelter continues firm, with little disposition on the part of buyers to sell on the spot at less than 5¢ for 10-ton lots. Tin is as dull as ever, and we again reduce our quotations a fraction. The Siberia, from Liverpool, brought 100 bxs. Tin Plates, Richardson & Co.; 564 bxs. do. do. order. The Ilyrian, from Liverpool, brought 22 bxs. Tin Plates, order. We quote: Straits, 13 1/2¢ @ 13 3/4¢; Banca, 16 1/2¢ @ 16 3/4¢; Refined English, 14¢ @ 14 1/2¢; gold. We quote Plate: Charcoal, I. C., \$5.75 @ \$6; Coke, \$4.75 @ \$5; and Charcoal Terne, \$5.40 @ \$5.50, gold.—Commercial Bulletin.

LOUISVILLE.

Messrs. GEO. H. HULL & Co., under date of Sept. 22, write us as follows: The market for Pig Iron is firm at full figures, with a fair demand. We have no change to report either in tone or price. The usual time, 4 months, is allowed on quotations below:

FOUNDRY IRONS.

No. 1 Hanging Rock, Charcoal \$21.00 @ 22.00
No. 2 " " 19.00 @ 20.00
No. 1 Southern, Charcoal 18.00 @ 18.50
No. 2 " " 16.50 @ 17.00

No. 1 Hanging Rock, Stonecoal and Coke 19.00 @ 20.00

No. 2 Hanging Rock, Stonecoal and Coke 18.00 @ 18.50

No. 1 Southern, Stonecoal and Coke 18.50 @ 19.00

No. 2 " " 17.00 @ 17.50

" American Scotch 18.00 @ 17.50

" Silver Gray 15.00 @ 17.00

MILL IRONS.

No. 1 Charcoal, Cold-short and Neut'l. 16.00 @ 17.00

No. 1 Stonecoal and Coke, Cold-short and Neut'l. 16.00 @ 16.50

No. 2 Stonecoal and Coke, Cold-short and Neut'l. 15.00 @ 15.5

INDUSTRIAL ITEMS.

MASSACHUSETTS.

The contract for furnishing the city of Lewiston, Me., with all the brasswork, stop-cocks, &c., used in connection with the service pipes of the new water works of that city, has been awarded to Wm. H. Gallison Boston. All of this work is to be very heavy and of the best material. The services are to be put in and the connections made by Smith & Smith, of Lewiston, Me.

RHODE ISLAND.

Within the past few days the American Ship Windlass Company, Providence, have shipped an iron pump brake windlass to George E. Hand, East Setauket, L. I., to go on a schooner building for Yates & Portfield, New York city.

Also an iron brake pump for N. P. Kean, North Weymouth, Mass., for a pilot boat building for Boston parties.

Also a No. 9 Emerson windlass and capstan for main deck for C. V. Minot's ship, building at Phippsburg, Me.; a pump brake windlass to Burhans & George, 62 South street, New York, to replace a Perley windlass on a steamer; and to Jonathan May & Sons, an iron capstan windlass for a schooner building in Delaware for Capt. Fennimore.

They have also shipped a No. 7 steam windlass for the steamship Saratoga, building at Chester, Pa., by John Roach & Sons, for James E. Ward & Co.'s steamship line of New York, and have nearly completed a messenger chain windlass for a steamship building by John Roach & Sons for Cuba, and a vertical windlass for the last of the Russian vessels.

Thus the four Russian vessels will all have these windlasses. The Columbus had the Harfield London windlass and took it off, and the American Company put on one of theirs. The State of California had their steam pump brake on her when she was sold; also the Saratoga.

CONNECTICUT.

The Pratt & Whitney Company, of Hartford, shipped to England last month, for use by a watch tool company, a planer, 20 inch by 6 feet engine lathe with latest modern improvements, including arrangements for cutting screw threads to the metric standard, and a wire-straightening machine. Also, to Mexico, a 16 inch by 6 feet engine lathe with taper attachment; an upright drilling machine with index for gauging the depth of holes, drill chuck, twist drills, &c.

NEW YORK.

Prospects at the iron works are very encouraging. The mills of the Messrs. Burden are all running on full time except those upon the hill, which have been practically abandoned. The steel works will be kept busy for several months filling orders at present on hand, and at the other mills of Corning & Co. the outlook is very favorable.—*Troy Times*.

PENNSYLVANIA.

Messrs. Stokes & Parrish, of Philadelphia, have just completed two hydraulic elevators, one for Strawbridge & Clothier, and the other for Darlington, Runk & Co., both leading dry-goods firms in Philadelphia, and both entering into new premises. The pressure is kept up to 60 lbs. to the square inch in the iron supply tank by means of small pumping engines, thus enabling them to use the same water over and over again. They are fitted with electric annunciators and all latest improvements, and appear to give entire satisfaction.

Nevegold, Schied & Co., Bristol, are exceedingly busy, running double time, with two sets of men. They manufacture all gauges of hoop band iron, and turn out about 50 tons per week.

Corydon Winch, of Philadelphia, manufacturer of bar iron, spikes, and general railway supplies, is busy, with good prospects for the coming winter. He is at present employing 125 men.

E. L. & H. B. Banes, Bristol, engineers and machinists, have been very busy for some time. Their specialties are small engines of say 5 to 20-horse-power.

We have to record a still better achievement of the Warwick Furnace than those we have noted from time to time. For the week ending Sept. 14, the furnace made 368½ tons, principally No. 2 Foundry, 125 tons being No. 3 but very gray. It has been a question whether these results have not been obtained by pushing the furnace. We are assured that this is not so, the aim being to make only that amount of iron that can be reached consistent with good quality, safety and economy. The heat is kept at 800 to 900 degrees. Mr. Edgar S. Cook is entitled to great credit for his admirable management.

Considerable building in connection with iron works has been done in Johnstown this season. The Cambria Iron Company have added a new building to the steel works. Another wire mill has been built, and not proving large enough, considerable additions to it are being made. The Gautier Steel Company, from Jersey City, have their very large building about completed, and are now putting the machinery in as fast as possible.

We clip the following from the Sharon Herald of the 20th inst.: At Westerman Iron Works, puddle, guide, hoop and sheet mills double turn; bar mill single up until the first heat on the night turn for Friday, when everything went down on account of the rain. The Kimberly mill looks dead and silent; a few hands are employed in cleaning up and putting things ship shape. At West Middlesex, the Fanny Furnace stopped up Friday about noon, and is likely to remain stopped the remainder of the week, as the stock is not sufficient to run until the roads are in order. From Sharpsville nothing special. The Douglas No. 2 is high and dry out of all danger, except its supply of limestone and coke. At the Stewart Iron Works, furnace No. 2 was stopped a couple of hours during the fracas, but no damage done the machinery.

The puddle mill of the Allentown Rolling Mill will start up this week, and the rail mill next week. An order has been received which will, it is said, keep the works going from six to eight weeks.

John M. Edson, one of the nailers in the employ of the Pottstown Iron Company, having charge of four of Gould's self-feeding machines, assisted by J. Shinehouse and Robert Slade, cut a grand total of 6100

pounds of nails, or 61 kegs, each keg containing 100 pounds. Messrs. Shinehouse and Slade each handled 3050 pounds of the nails. A run of 50 kegs of nails per week is considered unusually good, but the cutting of 61 kegs is surprisingly large.—*Reading Eagle*.

The Sharon Herald says: The stock of pig iron in the various furnace yards at Sharpsville is remarkably light, and will not aggregate more than 1000 tons.

The Latrobe Car Works are building for the Pittsburgh, Newcastle and Lake Erie Railroad 20 eight-wheel ballast cars, 20 box cars, 20 drop bottom coal cars and two baggage cars. The first-named lot have already been delivered.

The mill of Kimberly, Carnes & Co. at Sharon ceased operations finally on the 13th, and the future of it is now with the Bankrupt Court. Some 500 men are thrown out of employment.

The Keel Ridge Furnace, Sharon, blew out on the morning of the 15th after a successful blast of 23 months.

The Middlesex Mill is running six furnaces single turn.

The Fannie Furnace, West Middlesex, is in blast, making 40 tons a day.

Messrs. Huston & Co., contractors for the completion of the Cincinnati Southern Railway, have awarded the contracts to Philadelphia company for six iron trestles, two of which are 900 feet long, for \$150,000. The work on the road will be pushed forward rapidly.

PITTSBURGH AND VICINITY.

Cres, Graham & Co., of Allegheny, a new stove founding company, organized last year, are quite busy at present on grate fronts and their patent shaking grate, which is most effective and at the same time simple arrangement.

The Lemont Furnace Company at Lemont Station are showing a very good record as to the uniformity of their product. In a run of six months they have had only 4 tons of No. 2 iron and 20 tons of any lower grade. The furnace is owned by Ewing, Hanna & Co., of Pittsburgh, and managed by Robert Hogsett.

Reynolds & Moorhead's furnace at Red Bank, up the Allegheny River, is running, but there is some talk of closing down. They have an accumulation of 16,000 tons of iron on hand, a perfect field of good mill iron.

In the week ending Sept. 14, the Roche's Tumbler Company shipped 13 carloads of tumblers—the largest week's work the company ever did. The works are, and have been for months, running to full capacity, viz.: three furnaces, the number of hands employed being over 300.

The Superior Mill resumed operations on Tuesday of last week after an idleness of five years. The first rolling done being some angles for the steel bridge over the Missouri on the line of the Chicago and Alton R. R.

Messrs. Hussey, Howe & Co. are erecting at their works a 7-ton Siemens-Martin furnace. This is the second that will be in operation in the Pittsburgh steel mills.

John Robson & Son, at their chain works, have but six of their 14 fires in operation at present, making chain from 1 inch down and working only on orders. They are introducing some important improvements, both in machinery for cutting the links and for welding them.

The Crescent Tube Works are quite busily employed, both in the butt and lap weld departments, working nearly 200 men. Important improvements have been lately introduced and others are in progress.

One of the oldest rolling mill firms in this city is bowing to the inevitable and arranging to put in its works a Parnot Furnace. The age of the steel rapidly.

The mill of P. H. Laufman & Co., at Apollo, has been running double turn on sheet iron for the past six months, and present indications are that they will continue to run the same all the fall.

Lewis, Oliver & Phillips' lower mill, Allegheny, is running double turn in all departments.

NEW JERSEY.

The Trenton Lock and Hardware Company are very busy and likely to be so all winter. They are manufacturing among other specialties the Pelican money bank, on which they have had a large run. In a short time they will introduce several other useful and interesting specialties.

The American Saw Company, of Trenton, have got an injunction against J. E. Emerson, restraining him from manufacturing "slit" saws, the decision being that it is an infringement on the "perforated" saw patent which they control. They manufacture as specialties the movable tooth circular and perforated cross-cut saws. They have a new invention connected with the movable tooth, which will shortly be illustrated in this paper.

O. C. Bowman & Co., Trenton, manufacturers of terra cotta, are fully at work. They manufacture specially drain pipes, fire brick, &c.

Trenton Iron Company, Trenton, are exceedingly busy. They manufacture all kinds of wire, including screw binder spring, galvanized telegraph and pin wire. They are engaged in building a new tin shop and altering the buildings that were formerly the gun and ordinance works that they recently purchased. They have put one steam engine in these works and purpose putting two more in, which, when finished, they claim will be one of the finest and best equipped concerns in the country.

Charles Carr, now the Phoenix Iron Company, Trenton, are very busy and running full time. They manufacture all kinds of material for iron roofs, &c. This firm had large contracts for the material used in the New York Post Office.

WEST VIRGINIA.

The Benwood Mill started up in full blast on Wednesday the 18th.

OHIO.

P. Gerlach & Co., Cleveland, besides their home orders for stave and barrel machinery, have received a heavy order from Germany. Samples of stave-sawing machines for oil barrels and nail kegs are on exhibition at the Pittsburgh Exposition.

South Cleveland Advocate: The Old Mill stopped on Wednesday night for the purpose of putting a new foundation under the engine and rolls. It will probably take four

weeks before the mill will be ready to start again. For two or three days this week the heat, smoke and sulphur arising from the furnaces in the Old Mill were almost unbearable, and Mr. Wm. Garrett did a humane act on Wednesday when he caused vent holes to be made in the roof directly over the furnaces, for which the men are extremely thankful. Last week over 5000 rails 30 feet long, weighing 52½ pounds to the yard, and measuring in the aggregate 28 miles and 693½ yards, were turned out at the old rail mill of the Cleveland Rolling Mill Company. On Tuesday night and Wednesday of this week 902 rails were made, besides changing the rolls, all inside of 24 hours.

The Columbus Elbow Co. are running their shop to its full capacity, which is about 150 dozen elbows a day.

There are some good prospects of the rolling mill at Girard going into operation soon.

Workmen are busily engaged making the necessary preparations, and a speedy resumption is an accepted fact. The mill has been idle since November, 1876. It is well arranged and ought to turn out some good iron.

Its plant is 13 single boiling furnaces and two heating furnaces, double set of rolls in the muck mill, a 10-inch and one 8-inch mill.

The Girard Furnace is in blast.

The Eagle Furnace, Youngstown, blew out last week, having been in constant blast for three years lacking four days.

ILLINOIS.

The stove works at Quincy are all running full time.

Messrs. Shumway, Burgess & Co., proprietors of the Continental Boiler Works, Chicago, as successors to the late firm of Burgess, Clarke & Co. (which was dissolved by the death of the senior member of the firm in January last), are now running the above works to their full capacity. They employ 30 to 35 hands, and will do a much larger business this year than last.

The Joseph H. Brown Iron and Steel Co., near Chicago, are now running both in the iron department and the nail mill. A new post office has been established at these works, called Brown's Mills Post Office, Cook county, Ill.

INDIANA.

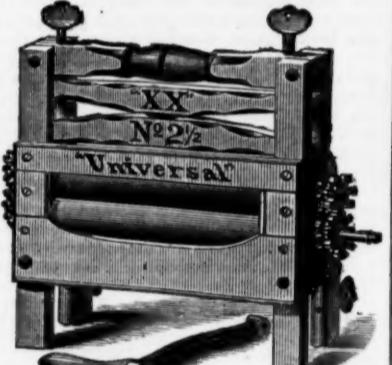
The Chicago, Burlington and Quincy shops, at Aurora, recently turned out two heavy passenger engines with 17 by 24 inch cylinders. They have Challender's patent smokestack. The car shops are turning out a large number of grain cars. The shops, which cover 30 acres, now employ about 500 hands, considerably under their usual number.

MICHIGAN.

There are rumors, says the Mining Journal, that the Grace furnace has been sold or leased to parties who will relight her fires at an early day, but we can trace them to no responsible source.

Not since the fall of 1873 has the outlook in this region been as bright and hopeful as at the present time.—*Neoguinean Herald*.

THE "OLD RELIABLE" UNIVERSAL Clothes Wringer.



Improved with Rowell's Double Cog-Wheels on both ends of each roll.

Over 500,000 sold!

And now in use, giving "Universal" satisfaction.

EVERY WRINGER WARRANTED.

Be sure and inquire for the "Universal."

Sold by the Principal Jobbers in Hardware and House-Furnishing Goods everywhere.

Special rates given for export.

Metropolitan Washing Machine Co.

32 Cortlandt St., New York.

B. W. PAYNE & SONS, Corning, N. Y., Established in 1850.

Eureka Safety Power, h.p. cyl. ht. space. wt. price.

2	3½	48 in.	40235	900	810
4	426	55	40236	1600	260
6	527	72	7242	2700	400

Also, Spark Arresting Portable and Stationary Engines for Plan-tations. Send for Circulars.

MACHINE MOULDED MILL GEARING.

AS ACCURATE AS CUT GEARING

AND MORE DURABLE IN USE.

Saves Time and Expensive Patterns,

SHAFTING, PULLEYS AND HANGERS,

A SPECIALTY,

LEFFEL TURBINE WATER WHEELS,

STEAM ENGINES AND BOILERS,

MIXERS FOR FERTILIZERS AND CHEMICALS.

POOLE & HUNT, Baltimore.

W. E. KELLY & BRO., 46 Cortlandt St., New York.

ACKNOWLEDGED THE BEST IN THE MARKET!

THE "TIFFIN" HAND CORN SHELLER

Patented August 17, 1875.

First Premiums were given to the TIFFIN at the following Fairs: Northern Ohio, 1873, 1875; Ohio State, 1873; Western N. Y. 1876; Central N. Y. 1876; N. Y. State, 1876; Connecticut State, 1876, and a number of other State and County Fairs where exhibited.

It is a Right Hand Sheeler. Frame made of hard wood, shafts of wrought iron. The parts are carefully fitted, ensuring durability, and ease to the operator. The panels are tastefully painted and the frame neatly striped, and all the woodwork stained.

The Hopper is adjustable, rendering it easy adjustment to either large or small corn as required. For price and terms, address

Tiffin Agricultural Works,
Tiffin, Ohio, U. S. A.

The Latest Novelty.
OUR TOY SCALE, TO PLAY STORE WITH.

Please the Children and sell on sight. Price \$4 per doz., net.

Special Prices in Gross Lots.





THE ROGERS SAW.

With Drilling Attachment and Iron Table,
Adjustable for Inlaying.

All the working parts of iron and steel. Weight, with box, 30 pounds.

Height of table above the floor, 32 inches; 12-inch belt wheel; 5 inch balance wheel; arms, 18 inches in the clear; latest improved clamps; round belts; extra drills and wrench.

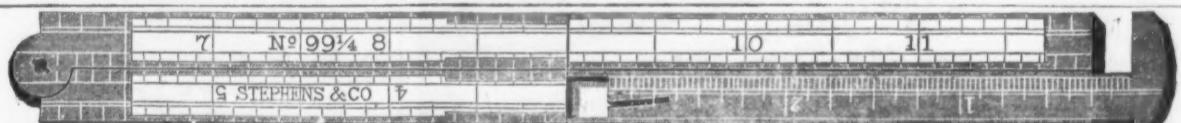
The iron and steel parts are polished or japanned. The wood is painted dark.

It is not as good as our Lester Saw, but is much better than any other cheap machine in the market.

Price, including all the attachments and the box, \$3.00.

MILLERS FALLS CO.,

74 Chambers Street, NEW YORK.

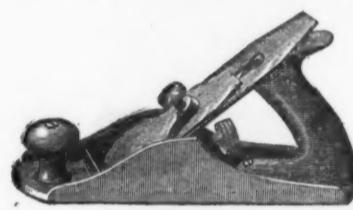


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BAILEY WRINGING MACHINE CO.,

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MANUFACTURERS OF
Novelty and Excelsior Clothes Wringers,
Defiance Metallic Planes,
Spoke Shaves, Try Squares, etc.,
Novelty Carpet Sweepers.

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Silver's Stuffers and Presses,
Simpson's Quick-Adjusting Parallel Vises,
Novelty and Relief Washing Machines,
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SPECIAL QUOTATIONS ON THE ABOVE GOODS FOR EXPORT.
Send for Illustrated Price List and Discount Sheet.

ESTABLISHED 1850.



W.M. HASSALL,
Manufacturer of
American and French
Wire Nails

With Flat, Round, Oval, Depressed, Screw and
Fancy Heads.

Molding and Finishing Nails, with or without heads. Brass Makers', Upholsterers', Chair and Undertakers', Finishing Nails a specialty. Shoe Nails of Brass and Iron. Bright Iron Rivets. Brass and Iron Escutcheons. Plus, with flat, round and fancy heads, all sizes on hand and to order.

OFFICE AND WORKS: Nos. 63 & 65 Elizabeth Street, New York.

THE STANLEY WORKS,

MANUFACTURERS OF

Wrought Iron Butts, Hinges
AND

DOOR BOLTS,

Plain, Japanned, Bronzed and Plated.

We have recently purchased CROOKE & CO.'S entire stock of WROUGHT BRIGHT BUTTS, orders for which are solicited.

FACTORIES:

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WAREHOUSE:
79 Chambers St., New York.

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MONTPELIER, VT., Manufacturers of

PATENT DOUBLE ACTING SPRING BUTTS,

Sabin's Lever Door Springs,

The BOSS and CROWN Door Springs,
For Screen and Light Inside Doors.

Established in 1839.

Formerly L. & A. G. COES.

L. COES & CO.
Manufacturers of L. Coes'
GENUINE IMPROVED
AND MECHANICS
WIDE BAR FULL LENGTH
WIDE BAR FULL LENGTH

Patent Screw Wrenches

UNDER PATENTS DATED

JUNE 26, 1866,
MARCH 23, 1869,
REISSUED 1870.

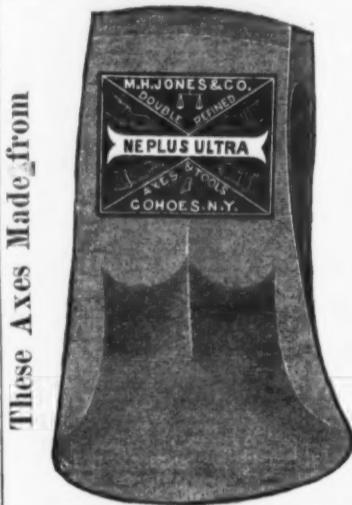
NOVEMBER 10, 1863,
FEBRUARY 23, 1864,
REISSUED JUNE 1, 1869,
IMPROVED AUG. 1, 1877.

The back thrust when in use borne by the SHANK instead of the Handle.

None genuine unless stamped "L. COES & CO."

WORCESTER, MASS.

Warehouse, 97 Chambers St., & 81 Reade St., N. Y.
HORACE DURRIE & CO., Sole Agents.



These Axes Made from
HORACE DURRIE & CO.
Agents, - New York.



Firth's Best English Cast Steel.

**NATIONAL
Horse Nail Co.**
MANUFACTURERS OF
FINISHED
(BRIGHT OR BLUED)



These nails are made of the best brands of NORWAY IRON, and are guaranteed to be equal to any in the market.

NATIONAL HORSE NAIL CO.,
VERCENNES, VT.
HORACE DURRIE & CO., Agents,
No. 97 Chambers St., New York

**PUTNAM'S
HOT FORGED & HAMMER POINTED
Horse Shoe Nails.**



Made from the best of Norway Iron. The only hot forged machine made Horse Shoe Nail in the world that is not skewed out of the point. Warranted never to split or silver in the driving, and to hold the shoe longer than any other Nail. For sale by the hardware and iron trade generally.

PUTNAM NAIL CO.,
P. O. Address, Neponset, Mass.

ANVIL NAIL CO.

We desire to call the attention of the trade to our new manufacture of

Steel Horse Shoe Nails,
made from metal prepared in the Martin-Siemens Furnace by our PATENT process, which produces a nail having all the requisites for a

PERFECT HORSE SHOE NAIL.

The well-known desirable properties of a perfect nail are, that the POINT should be sharp, the SHANK stiff, to drive without crippling under the hammer, soft enough to clinch readily, while sufficiently tough to avoid all danger from the "drawing the clinch" or breaking the neck under the head. These properties we claim for the

"ANVIL HORSE NAILS."

In the process of manufacture the metal is compressed under the head, which gives the nail great strength where it is required (between the shoe and hoof), and the cold rolling gives it a stiffness attained in no other way, while the quality of the metal used insures a clinch and point unsurpassed by any nail ever offered in the market. Samples and prices sent on application.

ANVIL NAIL CO.,
165, 175 and 185 Washington St., New York.

The 1878 Pennsylvania Lawn Mower.

LIGHT DRAFT AND EASILY ADJUSTED.



This machine presents all the advantages of a light and durable LAWN MOWER, and we believe has good qualities which cannot fail to be appreciated. It is the lightest machine in use, and all that is necessary to satisfy our customers of its superiority is to place it in competition with any other machine in the town in which they may reside.

Every machine warranted to work as represented.

PRICE LIST.

Width of Cutter.	Description.	Price.
12 inch.	8 in. driving wheel, wt. 33 1/2 lbs. Can be used by a lad, each, \$15.00	
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Hardware Specialties.

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Is double acting, throws a continuous stream 40 feet. Useful for sprinkling lawns and roads, washing windows, extinguishing fires, &c. Very simple and durable, and easy to work. Price, complete, boxed, \$7.00 each. Discount to trade.

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Patent Adjustable Pipe Tongs.

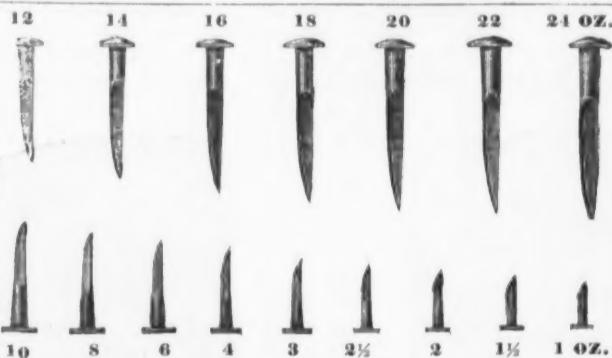


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SWEDES IRON, UPHOLSTERERS', GIMP AND CUT TACKS.

Tinned, Leathered and Large Head Iron Carpet Tacks.
TRUNK, CLOUT AND FINISHING NAILS, BRADS, PATENT BRADS, &c.
Lining, Saddle and Tufting Nails, Coffin Tacks and Tufting Buttons.
COPPER, ZINC, STEEL & SWEDES & COMMON IRON SHOE NAILS, &c.
Copper, Iron and Galvanized Boat Nails,

Regular or Chisel Pointed.

Brass & Iron Wire Nails, Moulding Nails & Escutcheon Pins, Chair & Cigar Box Nails, 2d & 3d Fine Nails, Roofing Tacks and Nails, &c., &c.

MADE BY THE

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MICROMETER CALIPER,
Made by THE VICTOR SEWING MACHINE CO.

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This attractive and very desirable tool will be found more reliable and convenient than the Vernier Caliper, and to Machinists and Tool makers it is indispensable on work requiring very accurate and close measurement. Its capacity is one inch, and is graduated to one thousandth; but can readily be set one-half and quarter thousandths; and is so constructed that any wear resulting from use can be readily adjusted.

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PRICES.
Single-Acting,

Per pair.
2x2..... \$.75
2½x2½..... 1.00
3x3..... 1.50
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5x5..... 3.00
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Discount to the Trade.

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Manufacturers of
Perfection Step Ladder.

PRICES.

3 feet..... \$2.50
4 "..... 3.00
5 "..... 3.50
6 "..... 4.00
7 "..... 4.50
8 "..... 5.00
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Discount to the Trade.

The Magic Carriage & Wagon Jack.

Patented April 23, 1878.

PRICE, - - \$12.00 per doz.

Liberal discount to the trade.

MAGIC JACK CO.,

Sole Manufacturers and Proprietors,

MISHAWAKA, IND.

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Manufacturers of DAMAN STANDARD HOLLOW AUGERS.—Universally acknowledged superior to any other in the market. They have recently been improved, and are now made of a much larger size and of a better quality of steel than any of their kind, either in design, material or workmanship. SPOKE AND DOWEL TRIMMERS.—The very best as well as the cheapest. METALLIC COMBINATION PLOW PLANE.—Made of solid cast steel and of great strength. Of an entirely new and improved design. RABBIT PLANE.—Will cut in any direction of the grain, and also as a Match Plane. COMMON SENSE DOOR SPRING.—The most durable and cheapest Door Spring yet made. LEAD PIPE CUTTERS.—To cut lead pipe in any position and without chips or burrs. Please send for circulars and prices.

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No. 34 Beale Street, New York,
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Sole Agents for the NORWICH PISTOL CO.

Send for circular and price list.



GEO. M. SCOTT,
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Johnson Street,
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CHICAGO, ILL.

EMPIRE FORGES

MOVED without Belts, Bellows, Crank Pins, Dead Centers or Lack Motion. Send for circular.

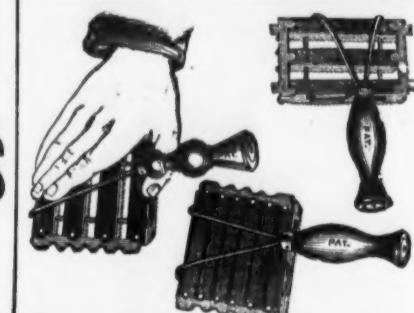
EMPIRE PORTABLE FORGE CO., COHOES, N. Y.

McNab & Harlin Mfg. Co.,
MANUFACTURERS OF
BRASS COCKS AND VALVES
For STEAM, WATER and GAS.
Iron Pipe and Fittings, Plain and Galvanized.
PLUMBERS' MATERIALS.

New Illustrated Catalogue and Price List sent by express to the Trade on application.

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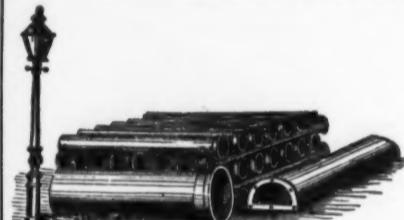
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We call your attention especially to our new patent end-pieces wire frame comb. The result of a long series of experiments made with a view to meet the requirements of a Perfect Comb. It is better, stronger and more durable than any ever before invented. The raised wire shank gives the hand never before been attained. The wire braces fit the hand in such a position that the hand cannot come in contact with the wire while using the comb. The wire braces which run from the shank over the back to the front teeth give strength and support to the wire shank, which is never before attained, and at the same time serve as an extra brace, and when clasped by the fingers in connection with the raised shank the comb is more firmly, easily, and completely held. It is more easily and conveniently adapted to the hand than is possible in any other formation—in short, it needs but a trial to vindicate its name: The Perfect Comb.

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Factory and Office,
382 2d Ave., cor. 22d St., N. Y.

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Sole Manufacturers of
CARR'S PATENT
Water Closets,
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Manufacturers of
Cast Iron Pipe
FOR WATER AND GAS.
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OFFICE & WAREHOUSE WITH
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I invite attention to my
PATENT
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Rieille Bros' Machines for testing Band Iron, Wire, and all other materials, by tensile, transverse, and crushing strains, from 100 lbs. to 500 tons capacity. New Machine for testing lubricants. Tools for Foundries, Mines, and Wharves. Scales for Furnaces, Rolling Mills, Mines, &c. Testing Machines adopted by U. S. Government. Specimens of materials tested daily at the Works. Trunk Cases, Drawing Instruments, etc. Highest Centennial Award. Office & Works, 9th St., above Master, Philadelphia. Warehouses, 50 & 52 S. 4th St., Philadelphia. New York Office, 9 Liberty St.



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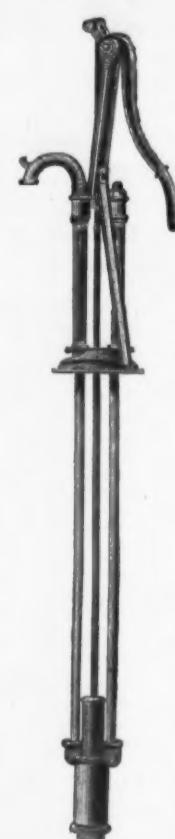
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The United States Centennial Commission has examined the report of the Judges, and accepted the following reasons, and decreed an award in conformity therewith.



PHILADELPHIA, May 4th, 1877.

REPORT ON AWARDS.

Product, *Files and Rasps.*

Name and Address of Exhibitor, *Nicholson File Company,*
Providence, Rhode Island.

The undersigned, having examined the product herein described, respectfully recommends the same to the United States Centennial Commission for Award for the following reasons, viz:

Being exceedingly well cut and of excellent material.

Daniel Steinmetz, of Pha.
Signature of the Judge.

APPROVAL OF GROUP JUDGES.

J. D. Imbogen, of Richmond, Va.
Chas. Staples, Jr., " Portland, Me.
G. L. Reed, " Clearfield, Pa.
J. Disenbach, " Germany.
David McHardy, " Great Britain.

A true Copy of the record.

Francis A. Walker,
Chief of the Bureau of Awards.

Given by authority of the United States Centennial Commission.

J. A. Campbell,
Secretary.

A. T. Goshorn,
Director General.
(21)

J. R. Hawley,
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8 ft.	500 lb.	\$22.50	\$1.00
8	1,000	25.00	1.20
8	2,000	30.00	1.50
8	3,000	40.00	1.75
8	4,000	50.00	2.00
8	5,000	75.00	2.20
10	8,000	65.00	2.40
10	12,000	150.00	3.75
12	12,000	200.00	3.75
12	20,000	300.00	6.00

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Size,	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	20	Inch.
Price,	\$1 40	1 60	1 85	2 20	2 60	3 00	3 65	4 35	5 25	6 10	7 30	8 75	10 50	12 50	14 75	20 00	

Flat File, Bastard, 8In.

H. DISSTON & SONS

Size,	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	20	Inch.
Price,	\$1 40	1 60	1 85	2 20	2 60	3 00	3 65	4 35	5 25	6 10	7 30	8 75	10 50	12 50	14 75	20 00	

Round File, Bastard, 8In.

H. DISSTON & SONS

Size,	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	20	Inch.
Price,	\$1 40	1 60	1 85	2 20	2 60	3 00	3 65	4 35	5 25	6 10	7 30	8 75	10 50	12 50	14 75	20 00	

Four-Square File, Bastard, 8In.

H. DISSTON & SONS

Size,	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	20	Inch.
Price,	\$1 40	1 60	1 85	2 20	2 60	3 00	3 65	4 35	5 25	6 10	7 30	8 75	10 50	12 50	14 75	20 00	

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Price,	\$1 60	1 90	2 25	2 65	3 10	3 60	4 25	5 00	5 75	6 75	8 00	9 50	11 25	13 25	15 50	22 00	

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Size,	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	20	Inch.
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Favorite Family.	dis 20
Scale Beams, Chatillon's list.	dis 20
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Scrapers.	dis 20
Brix, Hand.	W. dos \$200. dis 10 ²
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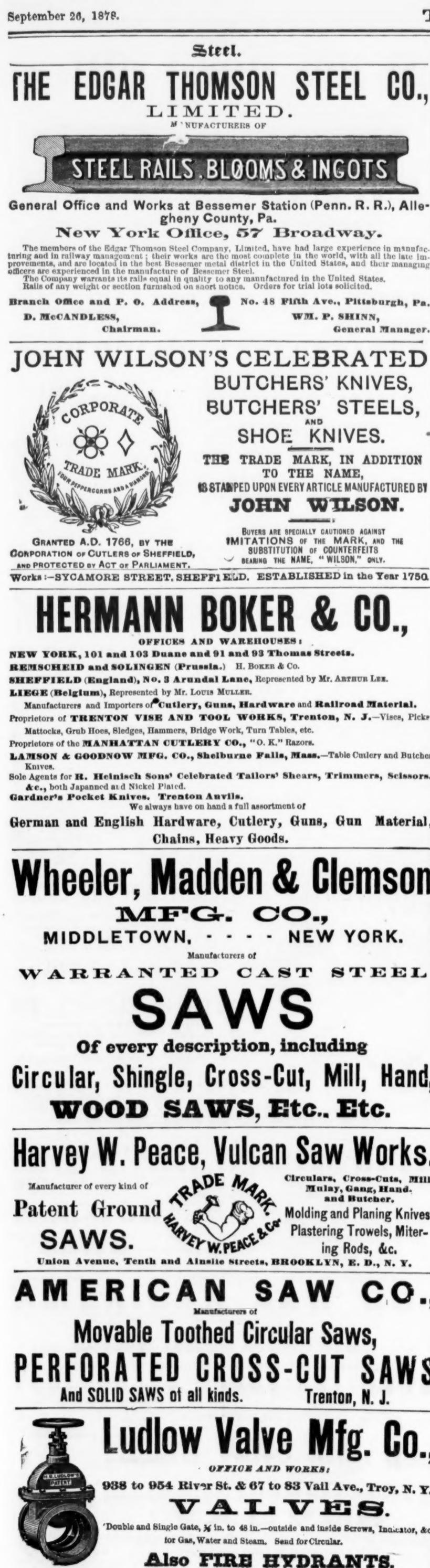
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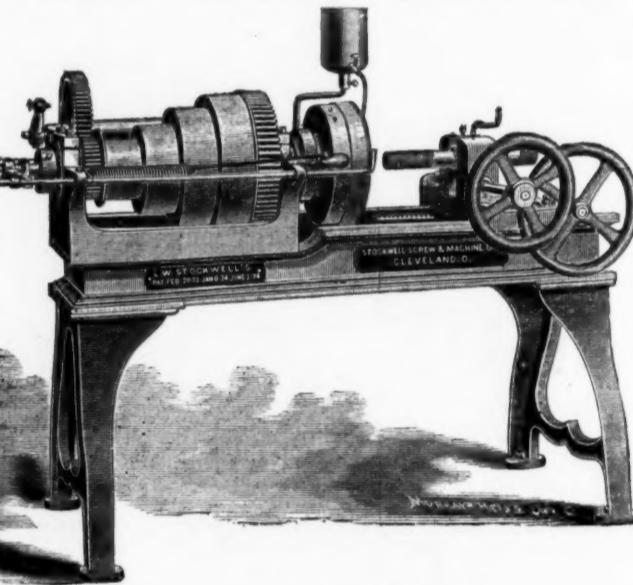
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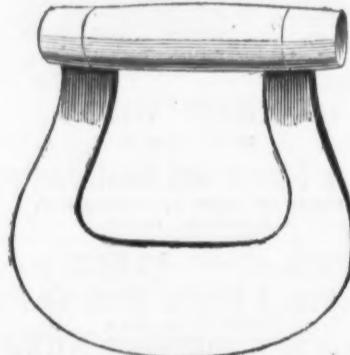
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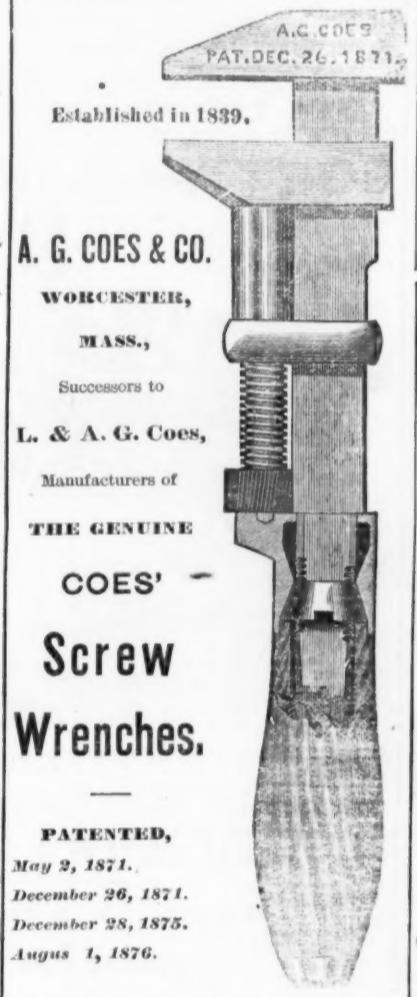
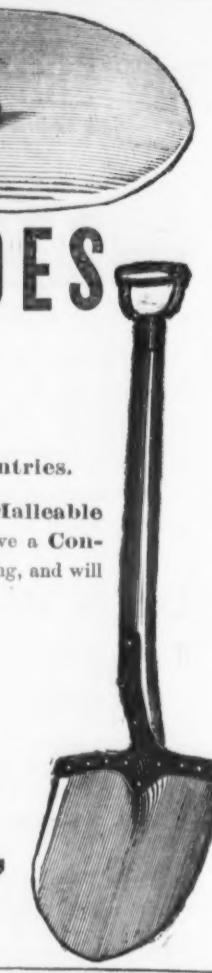
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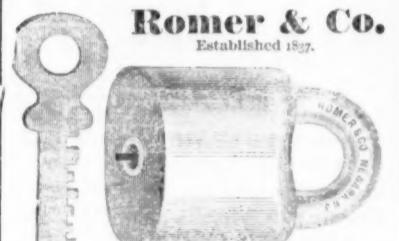
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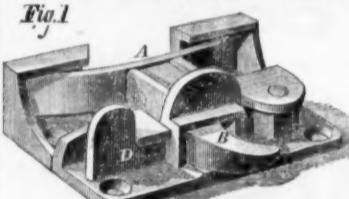
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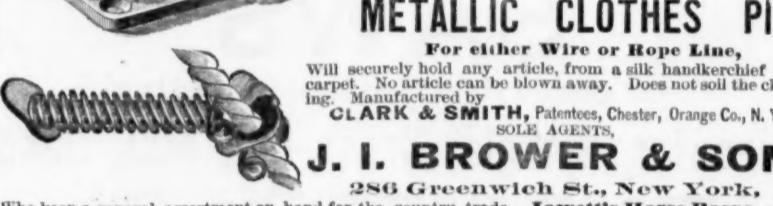


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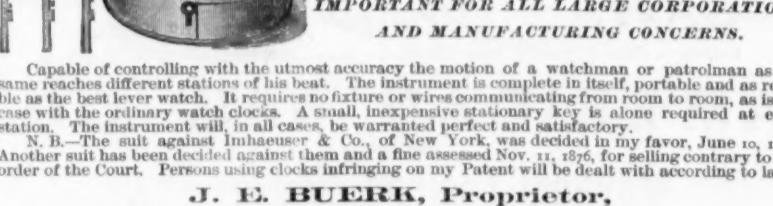
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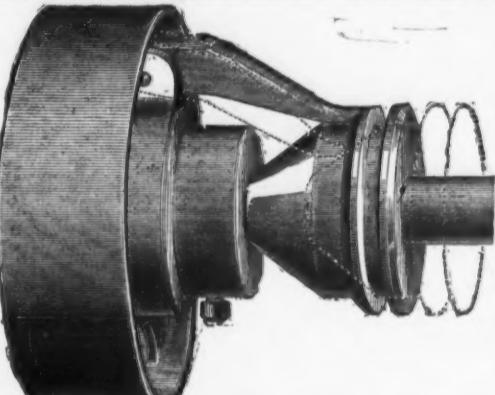
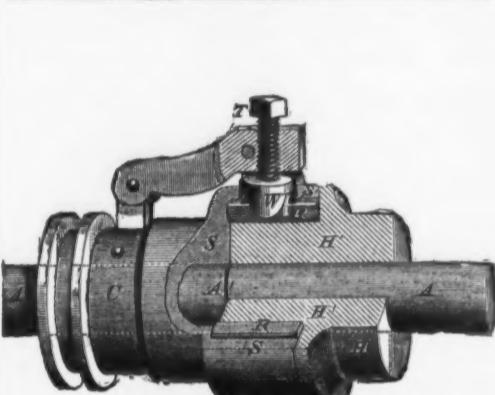
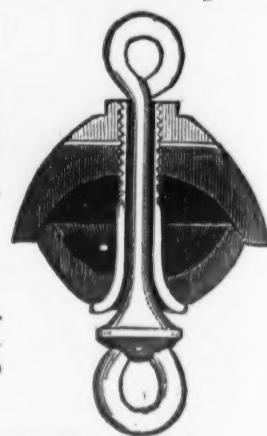
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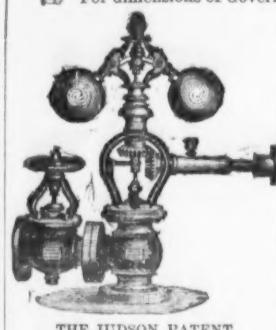
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3	31.00	33.00	2.75	3 $\frac{1}{2}$	36.00	4.00
3 $\frac{1}{2}$	40.00	45.00	3.50	4	45.00	4.25
4	45.00	51.00	3.75	4 $\frac{1}{2}$	50.00	5.00
4 $\frac{1}{2}$	59.00	67.00	4.50	5	60.00	5.50
5	90.00	101.00	6.00	5 $\frac{1}{2}$	105.00	7.00
5 $\frac{1}{2}$	120.00	133.00	7.50	6	120.00	8.00
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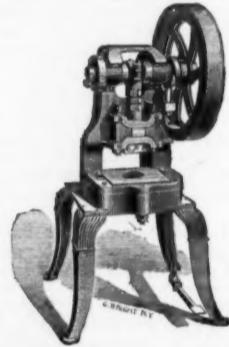
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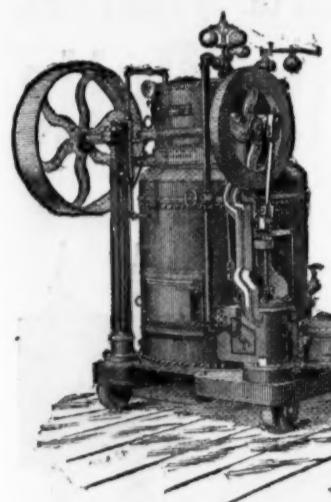
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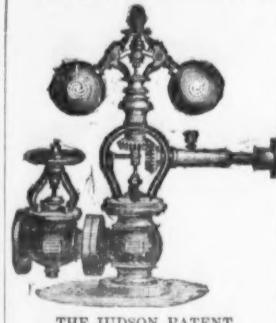
NILES TOOL WORKS,
Hamilton, Ohio.

Machinery, &c.

Reduced Price List,

FEBRUARY 1, 1877.

For dimensions of Governor, see Illustrated Price List.



THE JUDSON PATENT

Improved Steam Governor. No Charge for Boxing or Cartage.

JUNIUS JUDSON & SON, Rochester, N. Y.

Machinery, &c.

Established 1848.

WM. SELLERS & CO.,

600 Hamilton Street, PHILADELPHIA,

Engineers, Iron Founders and Machinists.

RAILWAY SHOP EQUIPMENTS.

Our Steam Hammers, Lathes, Planers, Drills and Bolt Cutters
Are of Improved and Patented Construction.

Railway Turning and Transfer Tables,
SHAFTING & MILL GEARING, a specialty.

Pivot Bridges.

GIFFARD'S INJECTOR--IMPROVED, SELF-ADJUSTING.



Issues Policies of Insurance after a careful inspection of the Boilers.

COVERING ALL LOSS OR DAMAGE TO

Boilers, Buildings and Machinery.

ARISING FROM STEAM BOILER EXPLOSIONS.

The Business of the Company includes all kinds of STEAM BOILERS.

Full information concerning the plan of the Company's operations can be obtained at the

COMPANY'S OFFICE, HARTFORD, CONN.,

or at any Agency.

J. M. ALLEN, Pres. W. B. FRANKLIN, Vice-Pres. J. B. PIERCE, Sec.

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A. J. DAVIS & CO., Patent Friction Hoisting Engines For Mines, Quarries, Dock Building &c. MANUFACTURERS OF SHAPERS, DRAIN PIPE MACHINES, BAG AND SATCHEL MACHINERY, Steam Engines, Wire Drawing Machinery, &c., &c. 69 N. J. R. Avenue, Newark, N. J. Correspondence solicited.

The Albany Steam Trap.

This Trap automatically drains the water of condensation from Heating Coils, and returns the same to the Boiler whether the Coils are above or below the water level in Boiler, thus doing away with pumps and other mechanical devices for such purposes. Apply to

Albany Steam Trap Company,

Albany, N. Y.

ESTABLISHED 1845.

The annexed cut shows one of the many styles of Coffee Mills of our manufacture, especially adapted to Grocer's use and all retailers of coffee. They are highly ornamental, and workmanship of the very best. We make more than 30 styles. ALSO LANE'S PORTABLE COFFEE ROASTER Will roast 30 to 40 lbs. at once, and can be used as a stove at other times. Send for descriptive list to Manufacturers.

LANE BROS., Millbrook, N. Y.

Also sold by leading wholesale houses.

Our agents, Graham & Haines, 113 Chambers St., New York, carry a full line of our goods, and will be pleased to serve you at Factory prices.

The "Boss."

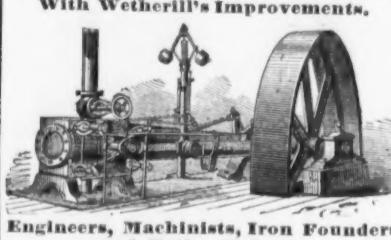
GEORGE N. PIERCE & CO., Buffalo, N. Y., Sole Manufacturers of the Most Perfect Funnel Hod.

The "Boss" Coal Hod was patented February 23, 1875. It is made of best refined iron; bottoms double seamed and riveted, and is so constructed that the mouth cannot become choked while discharging coal. Suitable for stove, grate, range or furnace fires. Special prices quoted to the trade and catalogue furnished on application.

Machinery, &c.

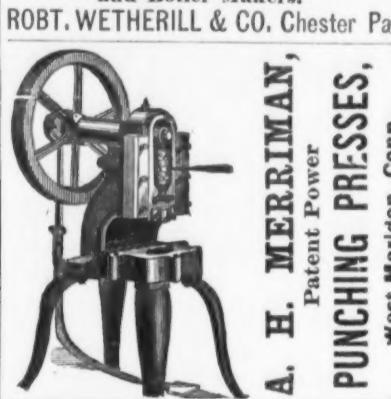
Corliss Engine Builders

With Wetherill's Improvements.



Engineers, Machinists, Iron Founders and Boiler Makers.

ROBT. WETHERILL & CO., Chester Pa.



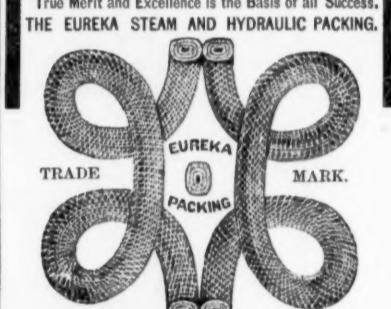
A. H. MERRIMAN,
Patent Power
PUNCHING PRESSES,
West Meriden, Conn.



ESTABLISHED 1844.
JOSEPH C. TODD,
Engineer & Machinist
Flax, Hemp, Jute, Ropes, Oakum
and Bagging Machinery,
Steam Engines, Boilers, etc.
I also manufacture
BAXTER'S
New Portable Engine
of 1875, of one horse-power, complete for \$125.
2 Horse Power.....\$285 1200
2 $\frac{1}{2}$ Horse Power.....\$330 1700
3 Horse Power.....\$375 2100
Can be had at a reasonable price at my store. Send for descriptive circular and price. J. C. TODD,
10 Barclay St., N. Y., or Paterson, N.

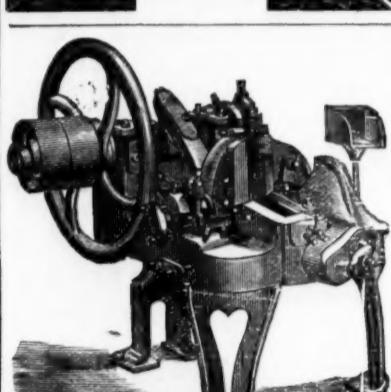


True Merit and Excellence is the Basis of all Success.
THE EUREKA STEAM AND HYDRAULIC PACKING.



SYMONDS & CO., 120 Exchange Place, Phila., Sole Manufacturers.

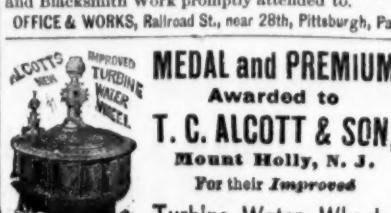
The results of a long series of experiments made with a view to meet all the requirements of a Perfect Packing. And we assert without reservation that it is the best article of its kind yet invented. It is made of the best materials, is pliable, and does not become hard by use, consequently, is easily taken out when renewal is necessary. It has a rubber center, rectangular in form, covered with a series of fine wire, and is impregnated with a lubricative compound superior to anything ever before used for the purpose, and contains nothing that can in any manner cut, flute or gum the pipe. It is no wonder, then, that it has received the highest praise of every engineer who has used it, and we have received many testimonials from the proprietors of Mills, Factories, Iron Works, &c., that it is a valuable, safe, and cheap packing they have used. All we ask is a fair trial, knowing it will convince better than any words of ours. Orders promptly filled. WICKERSHAM & CO., Sole Agents, 598 Fourth St., Philadelphia.



PITTSBURGH MFG. CO.,

Manufacturers of Nail and Spike Machines, Bolts Nuts, Washers, Rivets, &c. Castings, Forgings and Blacksmith Work promptly attended to.

OFFICE & WORKS, Railroad St., near 28th, Pittsburgh, Pa.



MEDAL and PREMIUM
Awarded to
T. C. ALCOTT & SON,
Mount Holly, N. J.
For their Improved
Turbine Water Wheels

TUBAL SMELTING WORKS,
160 South Broad Street, PHILADELPHIA.
PAUL S. REEVES,
MANUFACTURER OF
ANTI-FRICTION METALS.

XXX Genuine.....	.35c	C.....	.17c
XX.....	.35c	D.....	.14c
X.....	.30c	E.....	.12c
A.....	.35c	F.....	.10c
B.....	.30c		

"Note.—The above are my standard mixtures, and have given satisfaction wherever used, but I am prepared to make Anti-Friction Metal of any quality or mixture desired by the purchaser.

INGOT BRASS. | OLD METALS AND TURNINGS WANTED. | BRASS CASTINGS.

ESTABLISHED 1842.

WM. & HARVEY ROWLAND
PHILADELPHIA,

P. O. Address: Frankford, Phila., MANUFACTURERS OF ALL KINDS OF

Elliptic, Platform AND C Springs,

MADE EXCLUSIVELY FROM SWEDISH STOCK, OIL-TEMPERED and WARRANTED.

Swedish Tire, Toe, Blister and Spring Steel.

CAST SPRING AND PLOW STEEL.
CAST SHOVEL, HOE AND MACHINERY STEEL.

OXFORD TOE, SLEIGH, TIRE AND SPRING STEEL.
BESSEMER SHOVEL AND PLOW STEEL.
BESSEMER MACHINERY AND CULTIVATOR STEEL.

RE-ROLLED NORWAY SHAPES.
NORWAY NAIL RODS ROLLED AND SLIT FROM SUPERIOR BRANDS.

SMITH'S
PATENT MINCING KNIFE.

This celebrated Mincing Knife has been in the market for the past ten years. It is made from the best Cast Steel, and will cut twice as fast as the ordinary knife, and will not choke up in use like the old style of Two-Bladed Knives.

It is drawn over the wire
brace the same as a wood saw
is strained up for use.



The thin blades are held at full tension by the screw which passes through the handle.

The knives can be taken out and sharpened and replaced by use of the set-screw which passes through the handle.

C. E. JENNINGS & CO.,
Sole Agents, 98 Chambers St., New York.

IMPROVED STEEL CASTINGS.
Under Hainsworth's Patents.

We make Castings practically free from blow-holes, of steel which is as soft and as easily WORKED and WELDED as Wrought Iron, yet is STIFF, STRONG and DURABLE, with a TENSILE STRENGTH of not less than 65,000 lbs. to the square inch. In short, OUR CASTINGS UNITE THE QUALITIES OF STEEL AND WROUGHT IRON.

Wheels and Pinions, Dies and Hammer Heads, Engine and Machinery Castings of all descriptions, Railroad Frogs and Crossings, Plowshares, Moldboards and Landsides.

WE USE NO CAST IRON.

Send for circular.

PITTSBURGH STEEL CASTING CO.,
PITTSBURGH, PA.



J. M. CARPENTER, TAPS AND DIES of every description.
PAWTUCKET, R. I. Also, for sale low, UNITED STATES STANDARD GAUGES, from $\frac{1}{4}$ in. to 3 in.

The Reading Bolt & Nut Works. **J. H. Sternbergh,** Pa., U. S. A.

Manufacturer of a Superior Quality of

MACHINE BOLTS, HOT PRESSED NUTS,
Railroad Track Bolts, Boiler and Bridge Rivets, Bolt Ends, Washers, Wood Screws, Turnbuckles, Refined Bar Iron, Etc., Etc., Etc.

STANLEY G. FLAGG & CO.
PHILADELPHIA, PA.
Office and Warehouse,
No. 216 & 218 N. THIRD ST.
Manufacturers of
STEEL CASTINGS.

A Substitute for Steel and Wrought Forgings.

Circulars sent on application.

STEEL CASTINGS
From $\frac{1}{4}$ to 10,000 lbs. weight, true to pattern, sound and solid, of unequalled strength, toughness and durability. An invaluable substitute for forgings or cast iron, rendering the use of the latter unnecessary in all kinds, Shoes, Dies, Hammerheads, Crossheads for Locomotives, etc. 12,000 Crank Shafts of this steel now running proved superior to wrought iron. Circulars and price lists free. Address

CHESSTER STEEL CASTINGS CO.,
Evelina St., Philadelphia, Pa.

Steel Castings,

Light and heavy Steel Castings of superior metal, solid and homogeneous. All work guaranteed. Send for circular.

EUREKA CAST STEEL CO.,
Chester, Pa.
Office: 307 Walnut St., Phila.

DIAMOND



LANTERN.

R. E. DIETZ,

54 & 56 Fulton St., N. Y.,

Manufacturer of

TUBULAR LANTERNS,

"Catch-em-Alive" Mouse Traps.

Heads Polished and Lacquered.

PAT. MAR. 31, 1874

MAL-
LEABLE IRON AXE
WEDGE
NEATLY PUT UP. 1. DOZ WEDGES AND
GOOD COMIC CIRCULAR IN EACH BOX
MANUFACTURED ONLY BY
AMERICAN SLEIGH
AND CARRIAGE IRON CO.
BOSTON MASS.

Special attention paid to packing for export trade;
25c per dozen, 1877. Price, \$4.50 per gross; one sample
by mail, 15c; one dozen, 25c; one
dozen by mail, 50c. For sale by wholesale trade
throughout the United States and Canadas.

CONCORD AXLES
GENUINE
CONCORD AXLES

Warranted the best Article in the Market.

MANUFACTURED ONLY BY

D. ARTHUR BROWN & CO., Fisherville, N. H.

DRILL PRESS.

From New Patterns.

NEW IMPROVEMENTS

STRONG AND POWERFUL.

Cost One-third Less than
any Drill in the Market.

SEND FOR CIRCULAR.

H. BICKFORD,
CINCINNATI.

Machines

AND

Wheels

Guaranteed.

VOLNEY W. MASON & CO.,

Manufacturers of Patent

Friction Pulleys,

FRICTON CLUTCHES

For connecting Shafting and Gearing.

Hoisting Machinery & Elevators, Shafting, Hangers and Gearing.

Lafayette Street, PROVIDENCE, R. I.

See cut of Elevator Hoisting Machine in issue of

Sept. 19, 1878, page 58.

PATTERNS, MODELS

and Experimental Machinery of every description, made by

WM. BURROWS, 90 Fulton St., N. Y.

Scranton Brass Works,

J. M. EVERHART

Manufacturer of

BRASS WORK,

For Water, Gas & Steam. Also

Car & Wilcox Patent Cut Files.

Will cut faster, wear longer, and clog less than any file in market.

412 Street, SCRANTON, PA.

Russell, Burdsall & Ward,
PORT CHESTER, N. Y.

Manufacturers of

Carriage, Tire, Plow, Stove
AND OTHER
BOLTS.

Carriage Bolts made from Best Square Iron a Specialty.

JOHN RUSSELL CUTLERY CO.,
Green River Works,
MANUFACTURERS OF

Table and Pocket Cutlery,
BUTCHERS', HUNTERS', PAINTERS', DRUGGISTS' & HOUSEHOLD KNIVES
IN ALL STYLES AND VARIETIES.

FIRST HOME MANUFACTURERS.

New York Office,

90 Chambers Street.



Factories,
Turners Falls, Mass.

E. M. BOYNTON,

Manufacturer of all kinds of

First-Class Saws, Saw Frames, Cross-Cut Handles, Tools, Files, &c. Also Sole Proprietor and Manufacturer of the Genuine Patent Lightning Saw.

80 BEEKMAN STREET, NEW YORK.

TRIAL OF THE IMPROVED LIGHTNING SAW.

The Emperor Dom Pedro, accompanied by Director General Goshorn, Superintendent Albert, and others, visited Machinery Hall, at the Centennial on the evening of June 28th. Among other things inspected, at the invitation of E. M. BOYNTON, of New York, they witnessed a trial of the New Lightning Saw, patented March 26, 1876. Two men, with one of these saws, cut off a sound log of gum-wood, one foot extreme diameter, in seven seconds, or at the rate of a cord of wood in five minutes. Messrs. Corlies, Morell, Lynch, and other members of the commission witnessed the trial and timed the cutting. The Emperor remarked, That was fast, very fast cutting. Last evening the Emperor made another examination of the saw. —Philadelphia Press, June 30.

"BOYNTON'S SAWS were effectually tested before the judges at the Philadelphia Fair, July 6th and 7th. An ash log, eleven inches in diameter, was sawed off, with a four-and-a-half-foot lightning cross-cut, by two men, in precisely six seconds as timed by the chairman of the Centennial Judges of Class Fifteen. The speed is unprecedented, and would cut a cord of wood in four minutes. The representatives of Russia, Austria, France, Italy, Spain, Belgium, Sweden, England, and several other countries, were present, and expressed their high appreciation."

Received Medal and Highest Award of Centennial World's Fair, 1876.

\$1000 Challenge was prominently displayed for six months, and the numerous saw manufacturers of the world dared not accept it, or test in a competition so hopeless.

BAEDER, ADAMSON & CO.,
Manufacturers of **SAND & EMERY PAPER & EMERY CLOTH.**

(Also, in Rolls for machine work.)

Ground Emery, Corundum & Flint, Clue & Curled Hair, Hair Felt, & Felt-
ing for Covering Boilers, Pipes, &c., Cow Hide Whips

Stores: PHILADELPHIA, 730 Market St., BOSTON, 143 Milk St.
NEW YORK, 67 Beekman St., CHICAGO, 182 Lake St.

Bemis & Call Hardware & Tool Co.

This Wrench
can be fur-
nished with
Briggs' Pat.
Nut or Sleeve.

PATENT COMBINATION WRENCH.

These Wrenches are made from the best of Wrought Iron, with Steel Head and Jaw, case-hardened throughout, and not only combine all of the superior qualities of our Cylinder or Gas Pipe Wrenches, but also all the requisite Combinations of a regular Nut Wrench, thus making a combination which has no equal.

For Circulars and Price List, address

BEMIS & CALL HARDWARE & TOOL CO. Springfield Mass.

Am. Spiral Spring Butts

WARRANTED TO BE THE

Most Powerful and Most Durable Spring Hinges in the Market.



The same Butts can be used for either right or left hand doors. Send for reduced price list.

March 1, 1877.

MANUFACTURED BY

THE AMERICAN SPIRAL SPRING BUTT CO.,

No. 82 BEEKMAN STREET, NEW YORK.

Rod and Coil Door Springs,

GEM, STAR, TORREY,

GRAY'S

MANUFACTURED BY

VAN WAGONER & WILLIAMS, 82 BEEKMAN ST., NEW YORK.

The Iron Age

A Review of the Hardware, Iron and Metal Trades.

Publie chaque jeudi matin par DAVID WILLIAMS, No. 83 Reade Street, New-York.

Edition pour l'Exportation.

New-York, Jeudi, 3 Octobre, 1878.

Abonnement par an frs 25.

La Bibliothèque de "IRON AGE."

B. 3. Section Américaine,
Exposition Universelle, Paris.

L'exposition de l'*Iron Age* est d'un grand intérêt et d'une grande importance, soit pour les négociants européens en quincaillerie et produits métalliques, soit pour les représentants de l'industrie métallurgique visiteurs de l'exposition de 1878.

Elle se compose des documents et ouvrages suivants :

1,200 catalogues illustrés et prix-courants de fabricants américains de fer, acier, laiton et autres métaux.

850 photographies de fabriques et articles fabriqués américains.

50 atlas et cartes montrant le caractère des ressources naturelles des Etats-Unis et la manière dont elles sont distribuées.

500 volumes embrassant toutes les publications classiques américaines portant sur la métallurgie, la minéralogie, la géologie, les arts mécaniques, &c.

Cette bibliothèque comprend tout ce qui a pu être réuni de documents portant sur les gisements, les systèmes de réduction, la statistique de l'étendue et de la production du fer, de la houille, du cuivre, zinc, or, argent, pétrole et autres minéraux ou dérivés de minéraux industriels et précieux. Elle renferme en outre les prix-courants et catalogues, les photographies et lithographies représentant les usines, fabriques et produits de plus de 1,000 maisons américaines s'occupant de la fabrication de la quincaillerie, des poêles, articles métalliques, appareils mécaniques, &c.

Elle représente chaque branche d'industrie américaine qui s'occupe de la production d'articles composés en tout ou en partie d'éléments métalliques.

Les fabricants de quincaillerie américains ont acquis une certaine célébrité pour l'élegance qui distingue leurs prix-courants et catalogues. On y trouve généralement une profusion de clichés admirablement dessinés et exécutés, et nous nous empressons de prêter notre concours aux personnes appartenant à cette branche d'affaires en Europe, soit en mettant notre bibliothèque à leur disposition, soit en leur donnant tous les renseignements qu'elles désireraient ; nous leur faisons à ce titre l'offre de nos services.

L'exposition de notre bibliothèque a pour but de représenter le commerce américain en général et non de servir de réclame à notre établissement.

Ce recueil de livres, &c., est le produit exclusif des soins et des dépenses de l'exposant ; aucune autre personne n'y a contribué en quoi que ce soit ; le travail de collection et les frais d'exposition nous sont absolument personnels.

Les visiteurs à qui notre bibliothèque ou une partie quelconque de cette collection seraient de quelque intérêt, auront toute facilité de s'en servir.

DAVID WILLIAMS,
Editeur.

Revue Mensuelle du Marché de Quincaillerie.

Malgré la triste période que traverse une section de notre pays par suite des ravages que cause la fièvre jaune, les affaires y étant presque complètement paralysées, les transactions en quincaillerie en général pendant le mois de Septembre ont causé une surprise agréable aux fabricants et aux négociants de la ville, et les seules plaintes formulées aujourd'hui proviennent des maisons qui ont un grand commerce avec les Etats du Sud. La demande de presque tous les articles de quincaillerie destinés à approvisionner les Etats du Centre et de l'Ouest a dépassé le chiffre ordinaire des affaires de la saison. Il faut attribuer cette activité exceptionnelle d'abord aux taux extrêmement bas auxquels s'écoulent actuellement à peu près toutes les espèces de marchandises, ensuite à l'impression qui semble prévaloir assez généralement que tout changement de prix dans un avenir rapproché favorisera plutôt une plus-value qu'une dépréciation plus prononcée. Un autre motif d'ajouter foi à ce qui vient d'être dit est que partout aux Etats-Unis les stocks de marchandises existant en magasin ont été réduits aux proportions les plus minimes, conséquence de la baisse non-interrompue qui a prévalu pendant plusieurs années.

L'activité à laquelle nous venons de faire

allusion a été exempte de tout mouvement spéculatif, bien qu'il ait été affirmé que des commandes de vis pour bois de quelque importance aient été exécutées durant le mois et que la fabrication ait dépassé les besoins.

Le vil prix auquel ce genre de marchandises était abaisse est certainement de nature à attirer l'attention des spéculateurs ; mais d'un autre côté il ne faut pas perdre de vue que les fabricants de cette espèce de marchandises se disputent les ordres et que les principaux producteurs de vis peuvent être amenés d'un moment à l'autre à offrir à l'encaissement sans réserve leur excédant de production. Même au taux actuel nous ne saurons guère nous persuader qu'un bénéfice quelconque pourrait résulter d'achats spéculatifs semblables. Nous cotonnons les vis en fer pour bois, à tête plate, à un excempte de 70 pour cent sur la liste normale et à ce prix le marché demeure fermement soutenu.

Les clous ont joui d'une demande suivie à des chiffres faibles, favorisant les acheteurs. Dans notre numéro du 12 Sept., nous avons annoncé la faillite de la fabrique de clous "The Oxford Iron Co." C'est une des principales fabriques de clous coupés aux Etats-Unis, mais cet événement n'a eu que peu d'effet sur le marché. L'administration de cette fabrique a été confiée à un gérant dont le but est de rendre l'exploitation de l'usine au profit de créanciers aussi fructueuse que possible. On ne croit donc pas que le produit de cette usine sera jeté sur le marché d'une façon déraisonnable ou que l'administration suivra une ligne de conduite qui se départheid d'une entente harmonieuse avec les fabricants de clous associés des Etats Atlantiques. Le taux nominal des clous de rod à 60. n'a pas varié durant le mois de \$2.20 les 100 livres, mais les acheteurs de 100 barils et plus n'ont eu aucune difficulté à placer leurs commandes sur la base de \$2.15 net. Nous cotonnons, à la clôture, les clous de rod à 60., de \$2.15 à \$2.20 net, selon qualité.

La fabrique Russell & Erwin Manufacturing Co. et Messrs. Sargent & Cie ont publié des prix-courants avec escomptes modifiés au début du mois. Nos lecteurs se rappelleront que nous annonçâmes lors de notre dernière revue mensuelle les changements survenus dans le temps. Les listes publiées par ces maisons ne contiennent donc que peu de chose qui ne leur fut familier.

Le nombre des nouveautés offertes dans le marché durant le mois a été moindre que ce qui a lieu ordinairement et en ce qui a rapport aux changements il n'y a eu rien qui vaille la peine d'être signalé.

Le mois clôture au milieu de demandes actives pour presque tous les genres de quincaillerie à des taux soutenus.

Fer.

Le chiffre d'affaires qui s'est fait en fonte brute dans le courant du mois de Septembre a été tout à fait insignifiant, et le commerce se trouve dans un état aussi peu satisfaisant que possible. Presque toutes les transactions signalées ces jours derniers ont été surchargées de conditions tellement gênantes, tant sous le rapport du taux que du crédit alloué, qu'elles ont été entourées du plus grand mystère et toutes les fois qu'on s'enquiert du prix, on reçoit invariablement cette réponse : "à des conditions particulières." A vrai dire, à la seule exception de quelques marques privilégiées de fonte de Lehigh, qui se sont fermement tenues, toutes les cotes courantes imprimées peuvent être considérées comme nominales. De temps en temps nous sommes informés d'une vente de quelques centaines de tonnes de fer d'excellente qualité à des taux tellement bas que, sans une confirmation au-dessus de tout doute (difficile à se procurer) il serait évidemment imprudent d'en faire mention, mais comme de semblables rumeurs deviennent quotidiennement plus fréquentes, nous avons la conviction que le bon fer peut être acheté à des taux, qui, nous le croyons, ne couvrent pas le prix de revient. Les ventes de fonte américaine de toute qualité annoncées dans le marché New-Yorkais pendant le mois atteignent le chiffre de 11,750 tonnes seulement, mais il y a eu indubitablement beaucoup de transactions faites en sous main qui augmenteraient cet ensemble d'une façon notable si on en connaissait le chiffre. Vers la fin du mois il y a eu un semblant de reprise provoquée par des demandes de prix arrivées pendant les derniers jours et qui nous font supposer que nous sommes à la veille de quelques acquisitions importantes.

Nous cotonnons nominalement la fonte de moulage No. 1 de \$16.50 à \$18.50 ; la fonte de moulage No. 2 de \$15.50 à \$16.50 et le fer doux de forge de \$14.50 à \$15.50.

Les demandes de fonte écossaise ont été

faibles et l'ensemble des ventes au mois de Septembre ne dépassent pas 700 tonnes. Les fontes suivantes sont vendues, par petits lots, couramment, aux prix suivants : Glengarnock à \$23.75, Eglinton à \$22.75 et Coltness à \$24.

Les rails d'acier sont quelque peu recherchés, mais comme les acheteurs exigent généralement que la livraison suive immédiatement la commande, il n'y a que peu d'ordres agrégés par les laminaires dont la capacité de production est mise sévèrement à l'épreuve.

Le total des ventes de rails d'acier que nous avons pu annoncer dans le courant du mois est de 11,200 tonnes. Ce chiffre serait bien autrement grand, si les commandes pouvaient être effectuées avec plus de promptitude. L'extrême rareté des rails d'acier a engagé les acheteurs qui ont des besoins urgents à s'enquérir du taux des rails de fer et l'on nous assure que plusieurs demandes de prix ont été signalées ces jours derniers sans toutefois aboutir encore, paraît-il, à des transactions effectives. Nous cotonnons les rails d'acier livrables à l'usine de \$43 à \$44, et les rails de fer, selon qualité, et conditions de paiement, &c., de \$32 à \$36.

Il n'y a pas un bien grand mouvement à signaler sur les vieux rails. Les ventes effectuées dans le courant du mois n'excèdent pas 3000 tonnes. Le taux nominal des vieux rails est de \$17 à \$18 la tonne rendue à New-York. Les débris de fer sont cotés de \$20 à \$21, la tonne, fer forgé No. 1, pris au magasin du vendeur à New-York. Les ventes totales des quatre semaines écoulées se chiffrent par un ensemble d'environ 1100 tonnes.

Métaux.

Bien que les affaires en général se soient un peu ranimées depuis notre dernière revue mensuelle, les métaux sont demeurés assez calmes. Les vendeurs et consommateurs semblent vouloir persister dans leur politique de n'acheter qu'au fur et à mesure de leurs besoins immédiats, et les taux exceptionnellement bas ne les séduisent pas. Il en a été de même en Europe où les revendeurs n'opèrent qu'en hésitant. Le marché des métaux des deux côtés de l'Océan semble donc assez éloigné de l'époque de revirement qu'avait fait miroiter à nos yeux lors du règlement de la question d'Orient. Selon toute vraisemblance il faudra patienter jusqu'au printemps prochain avant qu'une amélioration sensible s'empare d'une situation encore quelque peu compromise. Il y a tout lieu de croire, cependant, que ce revirement se fera sentir aux Etats-Unis plus tôt qu'en Europe, vu les éléments essentiellement sains sur lesquels reposent notre commerce à l'intérieur par suite de l'abondance des récoltes de l'année dernière et de celle-ci. Cette abondance existe à peu près partout, y compris le sud qui, malgré le désarroi momentané dans lequel il a été plongé par les ravages de la fièvre jaune, se relèvera vite de ce malaise.

Comme au mois de Septembre 1873 nous avons été les premiers à élever le cri d'alarme, nous avons la ferme conviction que l'ère d'une prospérité renaissante sera inaugurée de ce côté de l'Océan dans un avenir assez prochain. Jusqu'à quel degré et à quelle époque les métaux bénéficieront de la situation dépend d'une foule de circonstances que nous ne pouvons apprécier aujourd'hui, mais il est clair que la valeur intrinsèque des métaux y jouera le rôle le plus important. Personne ne niera qu'aux taux actuels nous y touchons d'assez près.

Le nombre des nouveautés offertes dans le marché durant le mois a été moindre que ce qui a lieu ordinairement et en ce qui a rapport aux changements il n'y a eu rien qui vaille la peine d'être signalé.

Le mois clôture au milieu de demandes actives pour presque tous les genres de quincaillerie à des taux soutenus.

Charcoal Bright. — Contré toute attente, cet article a été peu recherché malgré les taux peu élevés qu'il atteints, et en dépit du stock réduit à New-York. La baisse à laquelle le fer-blanc a été en butte ici depuis la panique de 1873, sauterà aux yeux en étudiant le tableau suivant :

plusieurs reprises, depuis une vingtaine d'années, il faut croire que leur épaulement financier conseillerait le maintien de la paix et que le cuivre ne subira pas d'influences de ce genre.

Elain. — Ce métal est descendu au mois de Septembre au taux le plus bas auquel il soit tombé depuis trente ans environ, celui du Détroit ayant touché £56 à Londres et £33 1/2 ici.

Cette débâcle sans précédent a été occasionnée par l'excès des expéditions australiennes en Angleterre. Plus avancé dans le mois, quelques faibles détenteurs ont vendu leur stock et le marché s'est aussitôt relevé, sympathisant avec la réaction favorable qui avait lieu à Londres en même temps. Voici les cours de l'étain du Détroit à New-York depuis l'année 1876 :

Septembre 1877. 1878. Juin.

Quantité. Val'r. Quantité. Val'r.

Emouetteurs. 2 41

Moulins à chevaux. 20 24

Faucheuves. 1,019 765

Charrues. 155 129

Autres instruments. 1,379 887

Barrières. 111 67

Cloches. 13 12

Clirage. 105 102

Articles en laiton. 589 328

Brûques réfr. 254 26

Brosses. 146 172

Bougies. 219 234

Boîtes. 979 866

Wagons. 532 539

Pendules. 930 1,026

Houille, tonnes. 660,138 740,430 2,916

Minéral de cuivre, cwt. 32,947 169 21,432 109

Cuivre, barres, lbs. 11,297,876 2,102 13,461,563 2,718

Articles en cuivre. * 227 106

Cordage, lbs. 3,411,324 380 2,564,870 324

Poterie. 98 57

Verrière. 27 57

App. à gaz. 870 658

Colle. 31 16

Cables de chaînes. 146 176

Articles en caoutchouc. 305 219

Fouille, cwt. 115,633 140 63,601 89

Fer en barres, cwt. 50,399 133 50,622 105

Tôle, cwt. 2,160 12 2,611 14

Rails, cwt. 164,767 395 105,781 244

Feuillards. 2,480 13 4,989 22

Pièces moulées. 296 218

Roues de wagons. 6,316 69 7,617 122

Poilles. 121 113

Locomotives, nombre. 98 1,017 53 569

Machines fixes, nombre. 103 120 53 54

Chaudières. 110 100 70 70

App. à arcane. 3,850 2,698

Châssis et lampes, lbs. 1,208,603 288 9,316,659 320

Autres articles en fer. 3,988 3,362

Acer en lingots et en barres, lbs. 156,050 16 140,686 16

Coutellerie. 55 39

Outils tranchants. 911 721

Limousines, voitures. 40 36

Armes à feu. 2,099 5

Sommaire français des
annonces de l' "Iron Age."

Acer, Fabricants de.

ALRANY & RENNSLAER IRON & STEEL CO., Troy, N. Y. Bureaux à New York, 5 Broadway. Acerie pour la fabrication de MATERIEL DE CHEMIN DE FER et d'acier Bessemer.

CRESCENT STEEL WORKS, Miller, Metcalfe & Parker, fabricants de ferreries, 81 Wood St., Pittsburgh. Pa. Fabricant d'acier en tous genres. Spécialité d'ACIER POUR OUTILS, succursales à Chicago, 49 Dearborn St.; à New York, 725 North Second St., Agents WM. H. Miller, 125 Market St., à Philadelphie, et 114 John St., à New York.

SINGER, NIMICK & CIE, Pittsburgh, Pa., maison établie en 1848, propriétaires d'aciéries.

Acer martelé et laminé; le meilleur acier fondu pour outils tranchants et tournants, scies; plaques d'acier Siemens-Martin pour chaudières, etc. Acer fondu pour arbres de couche. Messieurs Hogan & Burrows, 99 Beckman St., agents pour l'Est.

THE NEWDALE STEEL WORKS, Aciéries et Bureaux à Nicetown, Pa. Acer à creuset et ACIER SIEMENS-MARTIN.

Bandages, Essuie, matériel de chemin de fer et goudron.

THE LABELLE STEEL WORKS, Smith, Sutton & Cie, Aciéries et Bureaux à Allentown, Pa., adresse postale Pittsburgh, Pa. Acer pour Ressorts, Essuie, Dents de Râtau, etc.

THE STANDARD STEEL WORKS.

Aciéries à Lewiston, Pa., bureaux 28, 4th St., Philadelphie. Fabricant de matériel de chemins de fer, etc.

Acer, Importateurs.

HOBSON, FRANCIS & SON, 9 John St., New York. Aciéries à New York, Angleterre. Agent, Charles Hugill. Seuls fabricants de l'acier London "Choice" et toute essence de fil d'acier.

SBORN, SAM'L & CIE, Aciéries à Sheffield, Angleterre; acier de R. Musket pour toutes les bandages et fils de fer.

WOLFF, R. H. & CIE, 56 Cliff St., New York. Importateurs de fer et d'acier; seuls agents de la compagnie.

WADLOW, S. C. Aciéries à Sheffield, Angleterre. Représentant à New York, MONSIEUR WILLIAM BROWN, 95 John St. Fabricants du célèbre acier pour outils fins, ressorts, etc.

Agents de Brevets d'Invention.

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WIEDERSHEIM, JOHN A., 10 South 4th St., Philadelphie, se charge de la vente des documents pour l'obtention de brevets, les marques de fabrique, etc.

Armes à feu.

MALTBY, CURTIS & CIE, No. 34 Readie St., New-York, agents de manufac- tures de quincaillerie de la "Norwich Photo" et "Crache-clous" ("Capewell" et "Pompey" Oxyd). Étampes et vernis émaillés.

REMINGTON, E. & FILS, 28 Broadway, New-York. Fabricants d'armes à feu dites "Remington." Introduction sur le marché d'un NOUVEAU MODÈLE DE REVOLVER, plaqué en nickel et poli à la lime. Calibre de 22 à 41, de 22 à 50.

Articles Argentés, de Pakhong et de Metal Britannique.

HALL, ELTON & CIE, Fabrique à Wallingford, Conn. Bureaux de Vente, Chambers Street, New-York.

Cuillères—Spécialité de la Cuillière "Or leans."

Articles de Fer Emalié.

THE METAL STAMPING & ENAMELING CO., 700-712 Second St., St. Louis, Mo. fabricant d'articles de Cuisine à émail, imitation de faïence, "Stone Iron Ware," forte, dure, propre, belle; breveté en Amérique et en Europe, et jouissant partout d'une popularité reconnue.

Articles de Fer Imitation de Faïence.

THE LALANCE & GOHSEN MANUFACTURING CO., 700-712 Second St., St. Louis, Mo. fabricant d'articles de Cuisine à émail, imitation de faïence, "Stone Iron Ware," forte, dure, propre, belle; breveté en Amérique et en Europe, et jouissant partout d'une popularité reconnue.

Articles de Fer.

ESTEY, W. S., 9 Fulton Street, New-York. Assortiment Général.

GILBERT & BENNETT MANUFACTURING CO., Georgetown, Conn. Fil de fer, Tamis, et Tôle Métallique.

HADDINGTON, JOSEPH, 29 State Street, Rochester, N. Y. Consolles à Pots à Fleurs, Grilles, Chaises, etc., etc.

OLIVER, E., 106 W. 3rd Street, New-York. Muselières, Tôle Métallique, Treillis, Tamis, Sourcilières, etc.

Articles forgés pour chemins de fer et locomotives.

JACKSON, M. D., 104 Adams Street, Baltimore, Md. Assortis d'ufs d'ameublement.

Articles pour Plaques de Nickel.

COLT, A. T., 47 Beekman Street, New-York. Assortiment complet. Métaux, Précieux en Planches.

CONDIT, HANSON & VAN WINKLE, Newark, N. J. Machine dynamo-électrique de Weston à l'usage des plaques de nickel.

ZUCKER & LEVETT, 69 W. 3rd Street, New-York.

Approvisionnement complet d'articles rentrant dans cette ligne d'industrie.

Articles pour plombier.

CARR, WM. S. & CIE, 105 et 110 Centre Street, New-York.

LaTrines à l'anglaise.

EVERHART, J. M., Cliff Street, Scranton, Pa. Aussi agent pour les Limes de Car & Wilcox.

Articles pour tapissier.

TURNER & SEYMOUR MANUFACTURING CO., 61 Beekman Street, New-York.

Attrape-mouches.

HAMILTON & MATHEWS, 27 Exchange St., Rochester, N. Y. Fabricants de l'attrape-mouches breveté de Fowler.

Balanciers à Poinçon, Fabricants de.

EECHER & PECK, successeurs de feu MILO PECK, New Haven, Conn.; S'occupent spécialement de la confection des Poinçons d'ESTAMPAGE.

Assurance contre l'explosion des chaudières.

HARTFORD STEAM BOILER INSPECTION CO. and Insurance Company, 100 Franklin Street, Boston, Mass. Agent, J. M. Allen, President; W. B. Franklin, Vice-Président; J. B. Flanagan, Secrétaire. Emission de polices d'assurance après une inspection attentive et minutieuse des chaudières domestiques pouvant résulter d'explosions de chaudières. La compagnie donne tous les renseignements que l'on désire sur ses dispositions pour sauvegarder les intérêts de ses commettants.

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BRANDON MANUFACTURING CO., Rutland, Vt. Fabricant des BALANCES PERFECTIONNÉES de HOWE, auxquelles ont été décrétées les deux premières médailles d'or au Concours de Philadelphie, 1876. Ces balances sont garanties supérieures à celles de tous autres fabricants, se distinguant par leur durabilité, leur simplicité, leur construction économique et leur excellente main d'œuvre.

Succursales dans toutes les grandes villes de l'Union Américaine et du Canada.

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BEVINS BROTHERS MFG. CO., East Hampton, Conn. fabrique de cloches, cloches et chaudières de bronze.

Cloches de Traineau.

COYNE & HATRY, 114 et 115 Water Street, Pittsburgh, Pa. fabricants de séparateurs de clous et cloches.

Cloches.

SHOENBERGER & CIE, Pittsburgh, Pa. fabricants de CLOCHES ANGLAISES.

Cloches universelles.

BEMIS & CALL HARDWARE AND TOOL CO., Springfield, Mass. fabricants de CLEF ANGLAISE combinée brevetée. On ajoute à volonté l'écrou et le manche de brigues.

COES, L. & CIE, Worcester, Mass. fabricants de CLOCHES, de fer et de bronze, etc.

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